PARITY RETURNS POSITIONS OF FARMS

A Report Pursuant to
Section 705
Food and Agriculture Act of 1965

U.S. Department of Agriculture   July 1967

CONTENTS

INTRODUCTION

This report is made pursuant to Section 705 of the Food and Agriculture Act of 1965 which states:

"The Secretary of Agriculture shall make a study of the parity income position of farms, including the development of criteria for measuring parity income of commercial family farms and the feasibility of adapting such criteria to major types of farms and to selected counties. The Secretary shall report the results of such study to the Congress not later than June 30, 1966."

Prior to June 30, 1966, the Chairmen of the Committee on Agriculture of the House of Representatives and the Committee on Agriculture and Forestry of the Senate requested that the study be continued until additional data were available from the 1964 Census of Agriculture. As a result, only a brief progress report was submitted prior to June 30, 1966. The study has now been completed and the results are embodied in this report.

The objective of this report is to develop and present certain criteria that might be used for determining when returns to labor and capital employed in farming are approximately equal to those obtained in other sectors of the economy. These findings are presented for the consideration of the Congress.

The report was prepared in the Economic Research Service, with the advice of recognized experts from five universities.

SUMMARY

Section 705 of the Food and Agriculture Act of 1965 directed the Secretary of Agriculture to make a study of parity income and submit a report to Congress. This is the report of that study.

Congress has defined parity income in three different pieces of legislation: (1) The Soil Conservation and Domestic Act of 1936, (2) The Agricultural Adjustment Act of 1938, and (3) The Agricultural Act of 1948. The history of this concept and its relation to the parity price concept are reviewed in Section I.

The parity income objective, however, has not been measured in a satisfactory way. This study presents statistical measurements of parity income in terms of a concept described as "parity returns." These are the returns that labor and capital employed in agriculture could get if they were employed in other sectors of the economy.

Parity returns standards are developed for all farms combined and for several size classes of farms as indicated by the value of sales. Computation by size classes is especially important as farm income varies in proportion to the amount of capital and labor used in production. Thus, parity returns take variations in the amount of capital and labor into account. Parity returns standards for equity capital and for operator and unpaid family labor are developed in Section II.

The return on capital has three interrelated aspects: (1) the value of capital, (2) the rate of return, and (3) capital gains. Of several alternatives examined, for return on capital, two were judged to be superior to the others. These are termed the "landlord standard" and the "stockholder standard."

The annual rate of return under the landlord standard is that obtained on rented farm land. This rate is applied to farm capital in terms of current value. The capital gains component under this standard is the average change in the value of farm real estate. Under the stockholder standard, the annual return is the dividend yield on common stocks. This is similarly applied to the value of farm assets. Capital gain consists of the average change in the price of these stocks.

When capital gains are included, these two standards yield higher rates of return than any of the other alternatives examined. They appear to be the most appropriate for measuring returns on capital invested in farming. On the average, returns under these standards are fairly comparable. Thus, four investment returns standards are employed in the study, namely the landlord standard, with and without capital gains, and the stockholder standard, with and without capital gains.

To each of these investment returns standards is added a parity return for labor supplied by farm operators and members of their family. The parity return to labor is deemed to be the income that a farmer could reasonably expect to receive if he stopped farming and applied his labor in other employment.

In general, a person's labor earnings throughout the economy are related to personal characteristics, such as age, sex, and educational attainment. Accordingly, the relationship of income to these characteristics for people in central cities were measured statistically. This relationship was used to estimate parity labor returns for operators of farms of different size classes and for unpaid family workers.

This resulted in an hourly wage rate for operators of all farms combined and for each of the size classes and for unpaid family workers. For operators of farms with value of sales of $20,000 or more, the resulting wage rate per hour is nearly 5 percent higher than the average wage of production workers in manufacturing industries. It declines gradually for operators of farms with lower sales value. Finally, these hourly wage rates are applied to estimates of man-hours required in farm production to obtain parity returns for labor.

In Section III, the parity returns positions for all farms combined and for several size groups of farms were measured for 1959, 1964, and 1966. Using the landlord standard, excluding capital gains, for example, realized net income per farm for all farms combined ranged from 56 percent of the parity return in 1959 to 81 percent in 1966.

For farms with value of sales of $20,000 or more, net income was 92 percent of parity returns in 1959 and 129 percent in 1966. Net incomes of other size classes of farms were below parity returns in all 3 years.

The inclusion of capital gains does not materially alter the parity returns position of all farms combined. It does, however, result in returns from farming being lower relative to the parity returns standards for farms with value of sales of $20,000 or more.

The dividend yield on common stocks averaged well below the rental rate of return on farmland. Therefore, net income from farming averages a consistently higher percentage of the stockholder standard, excluding capital gain than of the landlord standard. The reverse is true when capital gains are included.

Section III also includes a discussion of parity returns in relation to the parity price ratio. In 1966, for example, this ratio was 80. To have achieved a parity price ratio of 100 in that year, an increase of 33 percent in prices received by farmers would have been necessary. This allows for the fact that the increase in these prices would also have raised the index of prices paid as a result of higher food prices and also higher prices for resources purchased from other farmers.

On the other hand, a price increase of 11 percent would have sufficed to provide average incomes equal to parity returns for all farms combined--using the landlord standard excluding capital gains, and assuming no significant change in the volume of products sold. Farms with value of sales of $20,000 or more could have achieved parity returns with lower prices received and a lower parity ratio than prevailed in 1966. But the other three size classes of farms would have required higher prices for parity returns. Farms with value of sales of $10,000-$19,999 would have required a 10 percent increase, while farms in the $5,000-$9,999 would have needed a 38 percent increase in prices received.

In Section IV the application of the parity returns idea to different types of farms in different areas of the country is examined. Two different approaches are used. First the parity returns concept is applied to several of the commercial farms by type size and location for which the Department regularly reports information on costs and returns. Second the concept is applied to five model farms designed to represent well organized, efficiently operated farms producing specified levels of gross sales. Parity returns positions vary widely among different types of farms.

Interpretation and use of parity returns calculations are discussed in Section V. As measures of the economic condition of farmers, they represent an improvement over earlier definitions of parity income. In addition to avoiding the difficulties of definitions using an historical base period, they can be applied to different size groups of farms as well as to all farms combined.

In measuring the overall financial condition of farmers, particularly over relatively long periods, capital gains should be taken into account. The parity returns standard which provides the best measure for this purpose appears to be the landlord standard.

For some purposes, the use of parity returns calculations, excluding capital gains, are more appropriate. This is particularly true in the short-run where the object is to measure year-to-year changes in farm income and the direct effects of farm programs on farm prices and income. Here too, the landlord standard is preferable since the capital gains component in the annual return from farming is fairly comparable to the capital gain component in the parity returns standard.

If the parity returns calculations relating to farm size and to returns on capital and labor are to be used regularly, the necessary data must be collected on a regular basis. This is required to avoid inaccuracies that result from the present methods which rely on benchmark data available only at 5-year intervals in the Census of Agriculture. In theory, it would be desirable to have additional information to provide measures of parity returns positions for specific types of farms, but this would be very costly and it is doubtful if the benefits would be worth the costs.

Although parity returns could be theoretically translated into sets of commodity prices, this process would involve many statistical complications and it is not recommended that this be done.

Since parity prices have been used in the administration of commodity programs for three decades and the parity ratio is often used as a general measure of changes in the economic position of agriculture, this concept also needs to be examined. The parity price formula is a purchasing power concept that deals solely with prices--prices received by farmers, prices paid by farmers--in relation to the 1910-14 base period.

Prices play an important role in the determination of net farm income, but quantities sold also have a significant effect. The parity price formula omits consideration of quantities. Moreover the retention of the 1910-14 base period impairs the accuracy and reduces the usefulness of the parity index.

Finally, all parity formulas--whether in terms of welfare, income, or prices--have their limitations. They can serve only as general guidelines in policy formation.

SECTION I
PARITY--ITS HISTORY AND SIGNIFICANCE

Parity Prices

Discussions of farm programs and policies usually involve some reference to "parity," a word which has come to mean "equality" or "equity" for agriculture in an economic sense. A landmark in the development of this concept was the pamphlet, Equality for Agriculture, written by George Peek and Hugh Johnson in 1922.

The idea found its first legislative formulation in the Agricultural Adjustment Act of 1933 which stated that it was the policy of Congress to:

> "(1)....reestablish prices to farmers at a level
> that will give agricultural commodities a purchas-
> ing power with respect to articles farmers buy
> equivalent to the purchasing power in the base
> period. The base period in the case of all agri-
> cultural commodities except tobacco shall be the
> prewar period, August 1909-July 1914...."

The parity price formula resulting from this legislation and sub-sequent amendments is a purchasing-power concept. Parity prices are those which will give farm products generally the same per unit pur-chasing power in terms of goods and services farmers buy as prevailed in the base period 1910-14.

The most important modification of this formula was its modernization in 1950 to incorporate the intercommodity relationships that prevailed the 10 years immediately preceding. However, the purchasing power of farm products in general continues to be measured in terms of 1910-14.

Parity Income

Congress has defined parity income in three different Acts. These are (1) The Soil Conservation and Domestic Allotment Act of 1936, (2) The Agricultural Adjustment Act of 1938, and (3) The Agricultural Act of 1948.

The 1936 and 1938 Acts defined parity income in terms of the historical ratio (August 1909-July 1914) between the per capita income of the farm population and that of the nonfarm population. The use of this base period relationship called attention to the kinship between parity income and parity prices.

The 1936 definition included income of the farm population from both farm and nonfarm sources. In an earlier U.S. Department of Agriculture study 1/ income of the farm population from nonfarm sources was assumed to average $1.5 billion in the base period. On this basis, per capita income of the farm population has been above parity every year since 1941, with the exception of 1956. It averaged about 1/5 above parity in the last 5 years and about 1/3 above in 1966.

In the 1938 definition, per capita income of the farm population was limited to income from farming. By this definition per capita income of the farm population averaged around 105 percent of parity in the last five years and 120 percent of parity in 1966.

Per capita personal income of the farm population was 61 percent of the per capita income of the nonfarm population in 1966. Despite this, farm income was well above parity according to both the 1936 and 1938 definitions.

The Agricultural Act of 1948 defined parity income as follows:

> "(2) 'Parity', as applied to income, shall be that gross income from agriculture which will provide the farm operator and his family with a standard of living equivalent to those afforded persons dependent on other gainful occupations. 'Parity' as applied to income, from an agricultural commodity for any year, shall be that gross income which bears the same relationship to parity from agriculture for such year as the average gross income from such commodity for the preceding 10 calendar years bears to the average gross income from agriculture for such 10 calendar years."

This definition puts parity income on the basis of a direct comparison of equivalent standards of living. This is substantially different from the historical ratio of prices or incomes embodied in the earlier definitions. Although "equivalent standard of living" is a welfare concept, parity income was defined in terms of gross income and a measure of parity incomes for commodities was provided. These provisions implied that the use of parity income was applicable to commodity programs. Congress did not, however, so provide.

Although no official measures of parity income according to the 1948 definition have been developed, some relevant data are available. Hathaway has estimated that farm families require 86 percent as much money income as nonfarm families to have comparable welfare or purchasing power. 2/

1/ Possible Methods of Improving the Parity Formula. Senate Document 18, 85th Cong., 1st Sess. U.S. Government Printing Office, Washington, D.C. 1957.

2/ Hathaway, Dale E. Government and Agriculture. The MacMillan Co., New York, p. 38, 1963.

This estimate includes the differences between farm and nonfarm families in purchasing power of money income, income tax payments, value of home-produced food, and family size. The median money income of families living on farms, as estimated by the Census Bureau, was $4,122 in 1965, or 55 percent of the income received by nonfarm families.

Neither Hathaway's estimates nor the 1965 data relate specifically to farm operators and their families as defined by the Agricultural Act of 1948. They do, however, suggest that in terms of money income only, families living on farms in 1965 were well below the level that would provide a standard of living equivalent to that of persons in other occupations.

Limitations of Existing Definitions

The approach of the 1936 and 1938 definitions accepts the historical base period relationship as being a valid goal. Presumably it was related to the parity price concept which assumed that the relationship between prices received and paid by farmers in 1910-14 was in some sense a "normal" one.

The principal disadvantages of the base period approach are the difficulty of determining what base period should be used in the first place and the reluctance to change the base period often enough to keep it meaningful as technology and economic conditions change. The fact that the parity price formula is still based on 1910-14 illustrates this point. Furthermore, the application of the base period definitions in the 1936 and 1938 legislation shows recent average levels of farm income to be above parity. This is obviously inconsistent with the fact that per capita farm income has ranged from one-half to two-thirds that of nonfarm income since 1959.

The focus of the parity income definition in the Agricultural Act of 1948 is that of an equivalent standard of living to be provided by a certain level of gross farm income. This avoids the problem of in-appropriate or obsolete base periods, but raises serious problems of measurement and interpretation.

For one thing, the definition appears to be in terms of averages for all farm operator families. This is not a satisfactory approach to the problem of parity income for farms that differ markedly in size and volume of sales. Also, it is not clear whether the gross income from agriculture needed to provide an equivalent standard of living for farm operators and their families should take off-farm income into account. Finally, the addition of a gross income concept for each commodity that bears a historical relationship to parity income for agriculture as a whole has little validity from either an economic or statistical viewpoint.

Parity Returns

The approach to parity income presented in this report, includes comparisons for different size classes of farms, as well as for all farms. For each size class, a parity returns standard is calculated, reflecting the amount of annual return an "average" farmer in that size class could get by using his labor and capital in other employments. The actual return a farmer receives from farming is compared with the standard to measure his parity returns position. The expression "parity returns" will be used throughout this report to distinguish this concept from other definitions of parity income.

Although parity returns is a fairly simple concept, actual measurement involves numerous technical questions for which there appear to be no single right answers. However, this report does attempt to reduce the possible answers to such questions to a few reasonable alternatives.

Farmers' incomes do not come neatly packaged in separate compartments labeled "return on capital" and "return for labor." Farmers receive gross income, including nonmoney income. When production expenses are subtracted, the remaining net income constitutes the farmer's current return for his capital, for the labor which he and unpaid members of his family supplied, and for management. In addition to annual income, capital gains or losses have an important impact on the financial position of farm operators and their families.

This report examines several alternative ways of measuring a parity return on farm capital and develops a method of measuring a parity return to operator and unpaid family labor. In doing this, numerous assumptions were involved. The assumptions employed appear to be reasonable, but they are not the only reasonable ones that could have been used. Equally competent analysts might have chosen a substantially different approach to the question of parity income.

SECTION II
PARITY RETURNS--ALTERNATIVE APPROACHES

In this report parity income is defined as "parity returns."

To be specific, parity returns are defined as <u>income required to</u>
<u>make the current rate of return to the labor, capital, and management</u>
<u>employed in farm production equal to the current rate of return to</u>
<u>comparable resources employed in other sectors of the economy</u>.

Measuring parity returns involves two basic quantities: (1) The
actual income of farmers, including current net income and changes in
net worth; and (2) parity returns, reflecting what the farmers' resources
could earn outside of farming. The relation between these two quantities
gives an indication of the parity returns position.

The approach employed here goes beyond a comparison of overall farm
and nonfarm averages, in that parity returns positions are determined
for different size classes of farms. This breakdown is most important
as it takes into account the variations in income among different size
groups of farmers. Farm income generally varies in proportion to the
amount of capital and labor used in production.

In addition to the capital and labor supplied by farm operators and
their families, resources employed in agriculture include (1) labor
supplied by hired farmworkers and (2) land and other capital supplied
by nonfarm landlords and creditors who hold claims against assets used
in farm production.

Because such resources are not owned or supplied by the farmer or
his family, a parity return for these resources is not included in the
parity returns standards. Rather, the payments for these resources
(wages and salaries, rent paid to nonfarm landlords, and interest) are
a part of production expenses. As such, these items enter into the
calculation of net farm income, but not the parity returns standard.

Parity Returns to the Farmer's Capital

A critical element in the parity returns standard is the return on
the farmer's capital. Two quantities are involved--the value of the
capital and the annual rate of return on the capital. Each of these can
be estimated in several different ways, and the selections of the
estimating procedures are logically interdependent. Another factor
that affects the selection of an estimating procedure is the possibility
of capital gains or losses, especially those resulting from changes in
the prices of farm real estate.

Value of Farm Capital. Farm capital includes real estate and other capital made up of machinery and equipment, inventories of crops and livestock, and operating capital. Real estate accounts for about 80 percent of the value of all farm assets. The measures of capital employed in this study are in terms of current value.

The value of farm real estate has been increasing steadily for several decades. Official estimates of the current value of farm real estate are made by revaluing all farmland each year in terms of the prices of the relatively small percentage of farmland that is sold that year. This is a substantially different method of valuation from the "original cost" concept of investment in fixed assets--an accounting practice used by individual nonfarm businesses. 3/ The method is, however, quite similar to that used in estimating the total current value of common stocks.

The value of other capital--machinery and equipment, inventory of livestock and crops, and working capital--is small in relation to the value of farm real estate. Livestock and crop inventories and operating capital are valued in current prices because they can readily be converted to cash, while values of machinery and equipment are based on depreciated values. Thus, the valuation of livestock and crop inventories in current prices does not raise the questions that farm real estate does. Nor have there been consistent capital gains on non-real estate capital. During 1950 to 1964, there were 8 years in which there were capital losses in the value of non-real estate capital and 7 years in which there were capital gains.

For purposes of calculating parity returns, the comparable rate of return on this non-real estate capital should be the rate of return that could be obtained on capital in nonfarm investments of similar risk and stability. While it is difficult to identify capital situations that are comparable, it seems reasonable to expect that the farmer who shifts to nonfarm employment would endeavor to obtain the same rate of return as he could get on his real estate capital. Therefore, the same rate of return is used for both real estate and non-real estate capital.

3/ This approach was applied to agriculture by sythesizing a value for all farmland by revaluing only the percentage of the land that is sold each year. This is, in lieu of revaluing all farmland each year on the basis of prices for the land that is sold that year, only the portion of land sold is revalued. This calculation results in a value of all land that is a little more than half the total published value of farms now on the Department of Agriculture records. However, the calculations made on this basis were discarded as unsatisfactory compared to the other alternatives discussed in this section.

Implications of Capital Gains or Losses. The financial consider-
ations affecting farmers' decisions to continue farming include both
annual income and changes in net worth. Prices of farm real estate
have increased rapidly in recent years. As a result, current farm real
estate values include a substantial capital gain in the value of the
farm owners' equity.

In accordance with theoretical considerations and accepted practices
applicable at the national level of income measurement, capital gains and
losses, whether realized or not, are usually excluded from measures of
income. The guiding objective in measuring national income is the com-
prehensive coverage, without double counting, of the national output of
all goods and services. In this context, changes up or down in the value
of existing goods do not represent national income. These changes in
capital values are important to the owners of capital goods, but obviously
they have no bearing on the total amount of commodities and services
available to the Nation.

This exclusion is clearly valid for national income, but there is
increasing doubt that it is equally valid for individuals, at least with
respect to realized capital gains. If an individual, family, or group
could consume only what it produced, then capital gains and losses would
be of no significance. But for an individual or a group in an exchange
economy, a realized gain is clearly an addition to purchasing power and
a realized capital loss is an equally obvious reduction in purchasing
power.

With respect to unrealized capital gains, the case may be less
obvious but probably no less valid. Capital gain can be viewed as an
addition to or substitute for (hence, roughly equivalent to) current
savings and investment. Moreover, in an exchange economy, property can
be turned into current income at the owner's option. 4/

Capital gains on an investment are normally based on changes in
asset prices over several years, rather than on yearly fluctuations in
value. Also, possible influence of cyclical changes should be eliminated
from the standard. Hence, for inclusion in a parity returns standard,
an average capital gain over a period of years is more appropriate than

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4/ Recent literature on farm capital gains and losses includes the
following: Grove, Ernest W. Farm Capital Gains--A Supplement to Farm
Income? Agr. Econ. Res. 12:37-42, 1960; Boyne, David H. Changes in
the Real Wealth Position of Farm Operators, 1940-1960. Mich. Agr.
Expt. Sta. Tech. Bul. 294, East Lansing; Hoover, Dale M. Measurement
and Importance of Real Capital Gains in United States Agriculture,
1940 through 1959. Jour. Farm Econ. 44:929-940.

the change in asset value during a specific year. This consideration led to selection of a moving 10-year incremental average rate of change in calculating capital gains. For each year, this rate is computed as the annual compound rate of change between the 4-year period at the beginning and the 4-year period at the end of the preceding decade.

Furthermore, if capital gains are added to annual income in measuring farmers' overall financial position in relation to the parity returns standard, then it follows that during periods when farm asset values are declining, the resulting capital losses should be subtracted.

Rates of Return to Capital in Nonfarming Uses

Conceptually, the parity return is tne rate that would be earned on capital invested in enterprises other than farming under comparable conditions of risk and stability. However, there are no readymade nonfarm situations that clearly represent such comparable conditions. Four alternatives are considered. In each case it is assumed the farmer takes a nonfarm job, while investing his capital in one of four ways: (1) He retains title to his farm real estate and leases it to another farm operator, thus becoming a landlord. He also liquidates his non-real estate capital and reinvests in farm real estate, thus leaving the total value of the farmer's assets and his equity position the same before and after reinvestment. (2) He sells his entire farm and invests the value of his equity in common stocks. (3) He sells his farm and invests the value of his equity in a composite group of stocks, bonds, and savings accounts. (4) He sells his farm on a land contract and accepts a note bearing the current mortgage interest rate.

Each of these investment alternatives is examined below.

(1) The Landlord Standard. A landlord receives two kinds of benefits while owning and leasing out his farmland: Net rent and capital gain. Net rent paid for tne use of rented land is what the market indicates as the appropriate charge for the use of that land in farm production. Net rent has averaged close to 6 percent of real estate value in recent years, as shown in table 1.

The result of applying actual net rental returns on real estate to the current value of total assets, plus the 10-year compound rate of capital gains, less interest paid on borrowed capital is shown in table 2 for the years 1959, 1964, 1965 and 1966. Also shown is the net rate of return as a percentage of total investment value and equity value.

Table 1.--Ratio of net rent to value of farm real estate 1959-1966

Year	:	Ratio of net rent to value of farm real estate
1959	:	5.9
1960	:	5.9
1961	:	6.2
1962	:	6.2
1963	:	6.2
1964	:	5.8
1965	:	5.7
1966	:	5.6

Table 2.--Rate of return on total investment and value of equity

Year	Percent of total investment			Net rate of return as percent of the value of--	
	Annual rental return 1/	Capital gain rate 2/	Interest on borrowed capital 3/	Total invest-ment	Equity value 4/
	Percent	Percent	Percent	Percent	Percent
1959	5.9	4.4	0.7	9.6	11.1
1964	5.8	4.7	1.0	9.5	11.7
1965	5.7	4.8	1.1	9.4	11.7
1966	5.6	4.9	1.1	9.4	11.8

1/ Net rent as a percent of real estate asset value.
2/ Moving 10-year compound rate, calculated as the annual rate of change in total real estate value from the 4-year period at beginning to the 4-year period at the end of the preceding decade.
3/ Interest expense on borrowed capital as a percent of total investment.
4/ Rate of return on total investment divided by ratio of equity to total assets: 0.865 in 1959, 0.815 in 1964, 0.806 in 1965, and 0.800 in 1966.

(2) The Stockholder Standard. An alternative way of holding capital is to invest it in common stocks. In examining this possibility, it is assumed that the farmer sells his farm and invests the value of his equity in a portfolio of common stocks such as those listed in the Standard and Poor's 500-stock average. The dividend yield and rate of price change would be those of the 500-stock average.

The rate of dividend yield on the 500 stocks declined steadily during the 1950's from more than 6 percent in 1950 to about 3 percent in 1959, and remained at about this level until 1966 when it increased to 3.40 percent. Prices of these stocks have fluctuated widely, rising more than 20 percent in some years and declining by as much as 5 percent in other years. Over the period since 1948 increases have far outweighted declines, so that the average stock price index for 1966 was nearly 5-1/2 times as much as in 1948 or 1949. The average rate of capital gain in common stocks was calculated in the same way as for the rate for farm real estate. The average rates of increase ranged from 13.4 percent for 1959 to 7.6 percent for 1966.

Table 3.--Price index and dividend yields of the 500-stock average and 10-year average capital gain rates for selected years 1/

Year	Average price index	Change in price index from previous year		Current dividend yield 2/	Ten-year average capital gain rate 3/	Total capital gain plus current dividend yield
		Index points	Percentage change			
				Percent		
1959	57.38	+ 11.14	+ 24.1	3.23	13.4	16.6
1964	81.37	+ 11.50	+ 16.5	3.01	8.2	11.2
1965	88.17	+ 6.80	+ 8.4	3.00	7.9	10.9
1966	85.26	- 3.11	- 3.5	3.40	7.6	11.0

1/ Includes 500 common stocks--425 industrials; 50 public utilities; and 25 railroads. Annual data are averages of monthly figures, and monthly data are averages of daily figures. 1941-43=100.
2/ Aggregate cash dividends (based on latest known annual rate) divided by the aggregate monthly market value of the stocks in the group. Annual yields are averages of monthly data.
3/ Moving 10-year average calculated as the compound rate of change between the two 4-year periods at the beginning and end of the decade.

Source: 1967 Economic Report of the President, p. 297.

Thus, there has been substantial appreciation in the value of common stocks, as well as farm land. For both, the annual increase in value has been large in comparison to income.

An important point of difference is that the ordinary stockholder is free to realize his capital gains without affecting his employment income. The typical farmer, however, cannot usually sell small portions

of his land, because land is ordinarily traded in large blocks. Furthermore, selling part of his farm land could materially reduce the overall efficiency of his operation, or even alter his employment situation.

Over a longer period, however, the farmer has the option of refinancing to take advantage of increases in the value of his property. Thus, if investment in common stocks is taken as the alternative to farming, the parity return standard should include a rate of dividend yield plus the rate of capital gain in the prices of common stocks. These rates could be compared with the estimates of annual income and rate of capital gain for owners of rented farm land. The comparison of the two net rates of return on equity capital is as follows:

Table 4.--Comparative rates of return on landlord
and stockholder alternatives

Year		Investment Alternative	
		Landlord	Stockholder
	:	Percent	Percent
1959	:	11.1	16.6
1964	:	11.7	11.2
1965	:	11.7	10.9
1966	:	11.8	11.0

For the years 1964 and 1966, the stockholder investment alternative gives slightly lower rates of return than the landlord alternative. However, it should be recognized that in the stockholder alternative it is assumed that the reinvestment is on a 100-percent equity basis. If this assumption is modified to allow the stock investor to buy stocks on credit, then he can purchase more stocks and earn a higher rate of return than he could earn without credit. If the same percentage equity is assumed, the net rate of return for the years 1964 and 1966 is slightly higher than under the landlord standard, but not sufficiently so to warrant its use as an additional alternative.

(3) The Composite Investor Standard. The third investment alternative is to sell the farm and invest the proceeds in a composite portfolio of stocks, bonds, and savings accounts. This composite portfolio contains various kinds of securities in the same proportion as they occur in the U.S. economy as a whole. The resulting rate of return, calculated as a weighted average, is considerably below the first two alternatives--landlord and common stock investor. This investment

alternative has the advantage of being less risky than either of the first two alternatives. However, it can be argued that the investment alternatives considered should bear approximately the same degree of risk and uncertainty as farming. Following this line of reasoning, it seems that this third alternative is a less realistic standard for parity returns than either of the first two.

(4) The Creditor Standard. The fourth way in which a farmer can invest his capital is to sell his farm on a land contract, thus becoming a creditor to the new owner. In selecting this alternative, however, the farmer relinquishes all claim to capital gain resulting from future increases in land values. Conversely, of course, he eliminates the risk of capital loss if farm land values decline. Thus, the return to capital included in the parity standard for this investment alternative is simply the mortgage interest rate--about 5.9 percent in 1966. In measuring the actual income and net worth situation of farmers, the existing rates of capital gain on farm land would be added to net farm income. Thus, if this third investment alternative were selected, capital gain would be included on the income side but not in the parity returns standard. This alternative, like (3) above is considered to be less realistic than the first two alternatives.

Accordingly, only the first two alternatives, namely the landlord standard and the first shareholder standard are employed in the final computations of parity returns. The other two standards are presented simply for comparison.

Parity Returns to Labor

The parity return to labor is calculated as the income that a farmer could reasonably expect to receive if he stopped farming and used his labor in other employment. The parity labor return is the product of two components: The labor supplied by farm operators and unpaid family workers, and the wage rate this labor could earn in other occupations.

Farm labor input. Two different sets of estimates relating to man-hours of labor used in farming are available. One series is based on the Census-Bureau of Labor Statistics data on farm employment. It reports the number of workers and weekly average number of hours per week. This series provides the basis for separate estimates of the number of hours worked by operators, family workers, and hired workers.

The other series reports the number of man-hours required, rather than the number used, in farm production. This series is built up by applying regional averages of man-hours required per acre of crops and per head or per unit of production of livestock to the estimates of acres and numbers of livestock as reported by U.S. Department of Agriculture's Crop Reporting Board. Time required for farm maintenance or general overhead work is calculated separately and added to the direct labor to arrive at total man-hours required. This series is used in measuring farm output per man-hour. There is no breakdown of this

series between operators, family workers, and hired workers. For the 5 years 1960-1964, the estimated man-hours-worked series averages 30 percent higher than the man-hours-required series.

Neither of these series is completely acceptable for use in establishing parity returns for farm labor. It could be argued that the indirect estimates of the Census-BLS series overstate the number of hours worked, while the similarly indirect estimates of man-hours required understate the actual hours worked. Nevertheless, the man-hours-required series was selected because it was judged to correct for less than full man-hour equivalents, as well as for some degree of hidden unemployment in the farm employment series.

The Census-Bureau of Labor Statistics series is used, however, to allocate man-hours required among operators and family workers. The final labor allocation indicates that, in 1965, farm operators supplied 54 percent of the labor used on farms, unpaid family workers, 14 percent, and hired farm workers, 32 percent.

Rate of return to labor. It would be helpful if there were data on wage rates that could be identified as being the wage rates farm operators and unpaid family workers could be expected to earn in the nonfarm economy. Unfortunately, no such data exist.

In general, a person's labor earnings throughout the economy are related to several personal characteristics including age, educational attainment, and sex. Operators of farms in different economic classes exhibit considerable variation in these characteristics. Similarly, hired farm workers and unpaid family workers differ from farm operators on the average in these characteristics as shown in table 5.

A method of estimating wage rates for each of the groups in the farm work force is needed for inclusion in the parity returns standard. What is required is an objective measure of the labor earnings that people with similar attributes could command in the nonfarm economy.

To obtain an objective measure, five steps were followed:

(1) A multiple regression equation was calculated showing 1959 income as a function of age, education, and sex of people in central cities of urbanized areas.

(2) For each of the groups shown in table 5, the typical or median attributes (age, education, and sex) were put into the regression equation. The resulting income levels reflected the income that people having these attributes would have earned on the average in central cities of urbanized areas during 1959.

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Table 5.--Median age, educational attainment, and proportion of sales of U.S. farm operators by economic class of farm and hired farmworkers

Group	Level of gross sales Dollars	Median age Years	Median educational attainment Years	Proportion of males Percent
Farm operators by economic class of farm :				
I 1/..........................	40,000 and over	46.8	11.8	98.2
II 1/.........................	20,000 to 39,999	46.4	11.6	98.2
III 1/........................	10,000 to 19,999	48.1	10.4	98.2
I, II, III 2/.................	10,000 and over	46.5	10.5	98.2
IV 2/.........................	5,000 to 9,999	48.8	8.0	98.4
V 2/..........................	2,500 to 4,999	52.4	7.5	96.5
VI 2/.........................	Under 2,500	53.8	7.0	93.9
Part-time and abnormal 2/.....	Under 2,500	49.0	8.0	95.6
Part-retirement 2/............	Under 2,500	70.5	7.2	91.7
All farm workers 2/...........	---	51.0	7.8	96.3
Hired farm workers 3/.........	---	30.0	8.0	79.0
Unpaid family workers 4/......	---	40.0	7.8	40.5

1/ Age and educational attainment medians derived from preliminary data from the 1964 Census of Agriculture. Proportion of males assumed to be equal to the 1960 ratio shown for Classes I, II, and III combined.

2/ Unpublished estimates from a cooperative study conducted by the Economic Development Division, ERS, USDA, and Bureau of Census. In the study, some 9,000 enumeration schedules from both the 1960 Population Census and 1959 Agriculture Census were matched. Combined medians for Economic Classes, I, II, and III are used for 1960 because of the relatively small number of observations obtained for each of these classes in the 1960 study.

3/ Hired workers who worked more than 25 days on farms in 1959. From ERS series on hired farmworkers.

4/ Estimates developed in ERS. The median age is a rough approximation. The education and sex data are firm estimates.

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(3)   These 1959 annual income data were adjusted downward to
reflect income earned from wages and salaries only. This adjustment
was based on the percentage of total income from wages and salaries
to individuals with characteristics and incomes similar to those of
the operators of the various size classes of farms.

(4)   The annual wage and salary incomes for 1959 were converted
to hourly rates using estimates of the number of hours worked per year.
The estimated wage and salary income for operators of Class I, II, and
III farms combined based on 1960 characteristics were apportioned into
separate estimates for operators of farms in Classes I, II, and III on
the basis of 1964 age and education medians.

(5)   The 1959 rates were adjusted to 1964 and 1966 levels. This
adjustment was made on the basis of changes in the U.S. average manu-
facturing wage rate during this period. 5/ These rates are shown in
detail in table 6. Parity return wage rates for operators of farms in
four value of sales classes appear in table 7.

The key assumptions underlying the procedure outlined in 1-5 above
are that:

1.   The labor earnings of workers in central cities of urbanized
areas in each age-education-sex category changed in the same proportion
as the manufacturing wage rate.

2.   The age-education-sex characteristics of the different groups
of farm people did not change.

Lack of data on these characteristics for years after 1959 requires
these assumptions.

In brief, this analysis provides a method of estimating wage rates
for farm operator labor and management in the several economic classes
of farms as well as of unpaid family workers. For operators of farms
in Economic Classes I and II combined--the farms with value of sales
of $20,000 or more--this opportunity cost is above the U.S. average
hourly earnings of manufacturing workers. Wage rates derived for
operators of the other value of sales classes of farms, as well as for
unpaid family workers, are lower than the manufacturing rates because
of differences in age, education, and percentage males.

For purposes of calculating parity returns standards, the wage rates
shown in table 7 are considered as reasonable estimates of potential

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5/ Economic Report of the President, 1967. U.S. Govt. Printing Off.,
Washington, D. C., Jan. 1967, p. 241.

off-farm wages for the labor supplied by operators of the several value
of sales classes of farms, and for the labor of unpaid family workers.

Table 6.--Estimated "opportunity-cost" hourly rate of return for groups
in the farm working force, United States, 1959, 1964, and
1966

Group	1959 Opportunity cost hourly rate of earnings (1)	1959 Opportunity cost (1) as proportion of $2.19 1/ (2)	1964 Opportunity cost =(2) x $2.53 2/ (3)	1966 Opportunity cost = (2)x $2.71 3/ (4)
	Dollars	Ratio	Dollars	Dollars
Farm operators, by economic class of farm				
I ....:	2.31	1.055	2.67	2.86
II ....:	2.29	1.046	2.65	2.83
III ....:	2.14	.977	2.47	2.65
IV ....:	1.94	.886	2.24	2.40
V ....:	1.86	.849	2.15	2.30
VI ....:	1.80	.822	2.08	2.23
Part-time and abnormal ...:	1.93	.881	2.23	2.39
Part-retirement ....:	.95	.434	1.10	1.18
All farms .... :	1.90	.868	2.20	2.35
Hired farm workers ....:	1.54	.703	1.78	1.90
Unpaid family workers .....:	1.60	.731	1.85	1.98

1/ The wage rate for manufacturing employees in the United States in
1959 was $2.19 per hour, as shown in the 1967 Economic Report of the
President.
2/ The 1964 wage rate for manufacturing employees was $2.53 (ibid).
3/ The 1966 wage rate for manufacturing employees was $2.71 (ibid).

In developing net farm income estimates, wages for hired farm
labor are included in production expenses. No allowance is made for
hired farm workers in the parity returns standards. In this way, wages
are treated the same as other operating expenses. Actual increases in
wages paid hired farm workers would automatically be included in pro-
duction expenses and thus would decrease net farm income. This
parallels the treatment for capital not supplied by farm operators.
All the parity returns calculations in this report follow this approach.
An alternative would be to include hired labor in the parity returns
standard at the Federal minimum wage--which was $1.25 per hour in 1963-
1966. Another alternative would be to include hired labor in the parity
returns standard at the wage rates based on the average age, educational
attainment, and proportion of males in the hired farm working force

as shown in table 7. Use of these higher wage rates would result in
higher parity returns standards. Inclusion of these higher parity
returns might appear to be a move toward improving the economic
situation of hired farmworkers. However, merely including a specified
rate of return for hired labor in the parity returns standard would not
necessarily have any direct influence on actual wage rates paid to hired
farmworkers.

Table 7.--Parity Returns to Farm Labor Per Hour United States, 1959,
      1964, and 1966

Group	1959	1964	1966
	Dol.	Dol.	Dol.
Farm operators, by value of sales class:			
$20,000 and over 1/........................:	2.30	2.66	2.84
$10,000-$19,999 2/.........................:	2.14	2.47	2.65
$5,000-$9,999 2/...........................:	1.94	2.24	2.40
Under $5,000 3/............................:	1.72	1.97	2.09
All farms ....:	1.90	2.20	2.35
Hired farm workers 2/......................:	1.54	1.78	1.90
Unpaid family workers 2/...................:	1.60	1.85	1.98

1/ Weighted average of "opportunity-cost" hourly rate of return for
class I and II farms from table 6.
2/ Estimated "opportunity-cost" hourly rate of return.
3/ Weighted average for of "opportunity-cost" hourly rate of return
for Class V and VI, part-time and part-retirement farms from table 6.

Fringe Benefits

No allowance for fringe benefits has been made in the parity returns
for farm operators and unpaid family workers.

Estimates of Bureau of Labor Statistics place the money value of
fringe benefits of production and related workers in manufacturing at
17 percent of hourly money wages in 1959 and 19 percent in 1962. Paid
leave, irregular bonuses, required insurance programs, and private
welfare plans are included in the calculations. Bureau of Labor Statistics
has not made estimates for years since 1962. However, it is unlikely that
the value of these supplementary compensation practices have declined
since 1962.

Farm operators and unpaid family workers also receive fringe benefits.
Limited time and expense traveling to and from the job, consumption of
some home-produced food and a considerably greater degree of independence
are examples. No estimates of the total money value of fringe benefits

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of farmers are available. Without implying that farmers' fringe benefits are equivalent to those of factory workers, the existence of such benefits is mentioned as a partial offset.

Return for Management

Management is an increasingly important function in commercial agriculture. Commercial farmers are in fact entrepreneurs and businessmen; thus one could argue that parity returns should include returns to management as well as returns to the farmers' equity investment and labor. According to this line of thinking, returns to rural nonfarm businessmen of similar skills, education, and equity investment should be the basis for measuring the comparable returns in the nonfarm sectors of the economy.

There is certainly a degree of validity in this reasoning. However, even if it were completely convincing, measurement problems are a barrier. At present, no satisfactory measures are available to indicate the return to proprietors' management in nonfarm businesses.

After careful consideration, it was decided not to estimate a separate allowance for return to management for inclusion in these parity returns standards. Throughout the economy, management skills are required to attain a return on capital and labor. Hence, a return to management is assumed to be implicitly included in the return to capital and labor employed in farming.

Off-Farm Income

Off-farm income of farm families is not included in measuring the parity income position of commercial family farms. This is not intended to depreciate the large and growing importance of income from off-farm sources in the general income position of commercial family farms. However, our objective is to establish a measure of comparability of returns to resources between those employed in farm operation as such and those employed in other sectors of the economy. Therefore, the labor input used excludes time spent in off-farm employment, and the corresponding income excludes income from off-farm sources.

SECTION III

PARITY RETURNS POSITIONS FOR U.S. AGRICULTURE, 1959, 1964, AND 1966

In this section parity returns positions for 3 selected years, 1959, 1964, and 1966 are presented. Returns per farm from farming, with and without capital gains, are compared with four different parity returns standards. Specifically, realized net income per farm is compared with the landlord standard and the stockholder standard, excluding capital gains, while realized net income per farm, plus capital gains, is compared with the same standards, including capital gains. The return to labor under all four standards is the same. The basic data for these comparisons are summarized in tables 8, 9, and 10.

Trends in Farms and Farm Income

The earliest year for which comparable estimates of income and parity returns standards can be made for farms by value of sales classes is 1959. In that year, aggregate realized net farm income, $11.4 billion, was fairly typical of the farm income situation of the late fifties. In 1964, realized net income was $13.0 billion. This was reasonably representative of farm income conditions in the 1961-1964 period. In 1966, realized net farm income was $16.4 billion, 44 percent higher than in 1959 and, except for 1947, the highest of record. The levels of aggregate net income in these years obviously have important implications for the measurement of parity returns positions.

The number of farms declined from 4,097,000 in 1959 to 3,252,000 in 1966. As a result, the increase in average realized net income per farm from $2,773 in 1959 to $5,049 in 1966 is 82 percent, nearly twice as great as the 44 percent increase in aggregate realized net income. This fact should be kept in mind when trends in average income per farm are discussed in the following paragraphs.

Equity assets averaged $29,481 per farm in 1959 and $44,191 in 1966. The amount of operator and family labor averaged 1,729 hours in 1959 and 1,608 hours in 1966.

The number of farms with value of sales of $20,000 and over increased from 325,000 in 1959 to 527,000 in 1966. In 1959, these farms accounted for 8 percent of all farms and for nearly 50 percent of the value of farm products sold. By 1966, these farms were 16 percent of all farms and accounted for 68 percent of the total value of farm products sold. The average value of equity assets ranged from $128,000 in 1959 to nearly $141,000 in 1966. Operator and unpaid family labor was about 2,200 hours in 1959 and 2,100 in 1966.

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Table 3.--Number of farms, returns from farming, and returns from farming as percentage of parity returns, 1959, 1964, and 1966

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Number of farms		Cash receipts plus Government payments--	Returns from farming-- per farm			Returns from farming as percentage of parity returns			
							Landlord standard		Stockholder standard	
Value of sales class and year	Total	Percentage of total	percentage of total	Realized net farm income	Capital gain 2/	Total	Excluding capital gain 3/	Including capital gain 4/	Excluding capital gain 5/	Including capital gain 6/
	Thou.	Pct.	Pct.	Dol.	Dol.	Dol.	Pct.	Pct.	Pct.	Pct.
All farms:										
1959	4,097	100.0	100.0	2,773	1,042	3,815	56	59	67	47
1964	3,472	100.0	100.0	3,747	1,588	5,335	65	68	81	69
1966 1/	3,252	100.0	100.0	5,049	2,013	7,062	81	79	96	82
Farms with sales of-- $20,000 and over:										
1959	325	7.9	49.1	11,508	4,489	15,997	92	84	129	61
1964	424	12.2	61.2	14,979	5,521	20,500	113	97	158	101
1966 1/	527	16.2	68.3	17,539	6,298	23,837	129	107	167	112
$10,000 to $19,999:										
1959	503	12.5	21.5	5,091	1,521	6,612	68	67	83	54
1964	488	14.0	18.8	5,984	1,980	7,964	75	74	90	76
1966 1/	510	15.7	17.1	6,869	2,173	9,042	85	81	98	84
$5,000 to $9,999:										
1959	693	16.9	15.5	3,162	1,061	4,223	53	56	62	46
1964	530	15.3	10.7	3,434	1,387	4,821	54	59	64	60
1966 1/	446	13.7	7.9	3,989	1,527	5,516	62	65	70	67
Under $5,000:										
1959	2,576	62.9	13.9	1,114	509	1,623	35	42	39	35
1964	2,030	58.5	9.3	945	726	1,671	28	39	32	39
1966 1/	1,769	54.5	6.7	1,071	813	1,884	31	43	35	43

ERS-7/5/67
1/ Preliminary.
2/ Capital gain on operators' real estate assets at rates of 4.4 percent for 1959, 4.7 for 1964, and 4.9 for 1966.
3/ Column 4 as a percent of column 6 of table 10.
4/ Column 6 as a percent of column 7 of table 10.
5/ Column 4 as a percent of column 8 of table 10.
6/ Column 6 as a percent of column 9 of table 10.

Table 9.--Income and resources per farm, 1959, 1964 and 1966

Farms and year	Value of equity assets	Amount of labor used			Realized gross farm income	Farm operator family income		
		Operator and family	Hired	Total		Realized net farm income	Off-farm income	Total income
	Dollars	Hours	Hours	Hours	Dollars	Dollars	Dollars	Dollars
All farms:								
1959	29,481	1,729	785	2,514	9,145	2,773	2,071	4,844
1964	37,374	1,636	795	2,431	12,201	3,747	2,442	6,189
1966 1/	44,191	1,608	742	2,350	15,286	5,049	2,594	7,643
Farms with sales of-- $20,000 and over:								
1959	128,105	2,209	6,160	8,369	52,958	11,508	1,914	15,422
1964	132,639	2,167	4,675	6,842	58,142	14,979	2,116	17,095
1966 1/	140,672	2,114	3,569	5,683	61,784	17,539	2,148	19,687
$10,000-$19,999:								
1959	15,316	2,312	1,074	3,386	15,567	5,091	1,322	6,415
1964	47,699	2,203	748	2,951	16,139	5,984	1,480	7,464
1966 1/	48,659	2,125	545	2,670	16,698	6,869	1,516	8,385
$5,000-$9,999:								
1959	30,840	2,214	488	2,702	8,460	3,162	1,545	4,707
1964	32,891	2,043	379	2,422	8,753	3,434	1,764	5,198
1966 1/	33,720	1,978	276	2,354	9,112	3,989	1,816	5,805
Under $5,000:								
1959	13,580	1,424	131	1,555	2,550	1,114	2,378	3,492
1964	16,165	1,283	104	1,387	2,548	945	2,918	3,863
1966 1/	16,800	1,214	74	1,288	2,584	1,071	3,234	4,305

1/ Preliminary.

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Table 10.--Parity returns standards per farm, by value of sales classes, 1959, 1964, and 1966

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
				Parity Returns					
		To capital				To capital and labor			
		Landlord standard		Stockholder standard		Landlord standard		Stockholder standard	
Value of sales and year	Operator and family labor 1/	Excluding capital gain 2/	Including capital gain 3/	Excluding capital gain 4/	Including capital gain 5/	Excluding capital gain 6/	Including capital gain 7/	Excluding capital gain 8/	Including capital gain 9/
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
All farms:									
1959	3,179	1,773	3,273	945	4,894	4,052	6,452	4,122	8,075
1964	3,528	2,196	4,550	1,121	4,186	5,724	7,878	4,649	7,714
1966	3,757	2,467	5,173	1,502	4,861	6,224	8,930	5,259	8,618
Farms with sales of-- $20,000 or more:									
1959	4,328	7,711	14,305	4,098	21,265	12,542	19,133	8,026	26,095
1964	5,195	7,800	15,550	3,979	14,856	13,295	21,045	9,474	20,351
1966	5,727	7,852	16,556	1,782	15,471	15,579	22,283	10,509	21,201
$10,000-$19,999:									
1959	4,726	2,736	5,095	1,419	7,521	7,456	9,915	6,169	12,211
1964	5,197	2,807	5,631	1,430	5,312	8,004	10,828	6,627	10,530
1966	5,371	2,716	5,769	1,655	5,355	8,087	11,110	7,026	10,724
$5,000-$9,999:									
1959	1,159	1,854	3,420	987	5,120	5,803	7,550	5,126	9,259
1964	1,109	1,932	3,817	987	3,683	6,341	8,226	5,396	9,092
1966	1,567	1,986	3,950	1,116	5,708	6,453	8,107	5,713	9,276
Under $5,000:									
1959	2,412	814	1,486	354	2,254	5,226	5,898	2,846	4,666
1964	2,486	947	1,842	485	1,610	3,435	4,528	2,971	4,296
1966	2,501	958	1,923	571	1,847	3,430	4,425	3,072	4,548

1/ Nonfarm "opportunity" returns to operator and unpaid family labor. 2/ Net rental returns to operators' total assets less interest charges on operators' real estate and other debt. The net rental rates of return are 5.9 percent for 1959, 5.8 for 1964, and 5.6 for 1966. Interest rates charged on real estate debt are 4.9 percent for 1959, 5.3 for 1964, 5.1 for 1966, and on other debts are 5.4 percent for 1959, 5.6 for 1964, and 5.9 for 1966. 3/ Same as described in footnote 2, except with capital gains to operators' total assets included in the returns at rates of 4.4 percent for 1959, 4.7 for 1964, and 4.9 for 1966. 4/ In this standard (option A) the "opportunity" investment is limited to operators' equity capital and receives a dividend yield of 3.2 percent for 1959, 3.0 for 1963, and 3.4 for 1966. 5/ Same as described in footnote 4, except with capital gains to operators' equity capital included in the returns at rates of 13.4 percent for 1959, 8.2 for 1964, and 7.6 for 1966. 6/ Columns 1 plus 2. 7/ Columns 1 plus 3. 8/ Columns 1 plus 4. 9/ Columns 1 plus 5.

The number of farms with value of sales of $10,000 to $19,999 changed from 503,000 in 1959 to 510,000 in 1966. As a percentage of all farms, the change was from 12 percent in 1959 to 16 percent in 1966. Farms in this category accounted for 22 percent of the value of farm products sold in 1959 but dropped to 17 percent in 1966. These farms averaged $45,000 in equity assets in 1959 and nearly $49,000 in 1966. Operator and family labor averaged 2,300 hours in 1959 and 2,125 hours in 1966.

The number of farms with value of sales of $5,000 to $9,999 declined from 693,000 (17 percent of all farms) in 1959 to 446,000 (approximately 14 percent of all farms) in 1966. These farms accounted for nearly 16 percent of total value of sales in 1959 but only 8 percent in 1966. Hours of operator and family labor declined from 2,214 in 1959 to 1,978 in 1966.

Farms with value of sales of under $5,000 declined from 2,576,000 (63 percent of all farms) in 1959 to 1,769,000 (54 percent) in 1966. The average value of equity assets rose from $13,580 in 1959 to $16,800 in 1966. The average amount of operator and family labor declined from 1,424 hours in 1959 to 1,214 hours in 1966.

Parity Returns for all Farms

Under all four standards, the ratio of actual returns to parity returns increased from 1959 to 1966. In 1959, the percentage of parity returns ranges from 47 percent to 67 percent, while in 1966 it ranges from 79 percent to 96 percent, depending on which standard is used as the basis of comparison.

Several things stand out in these comparisons. First, realized net income per farm as a percentage of parity returns is consistently lower under the landlord standard, excluding capital gains, than under the stockholder standard, excluding such gains. The respective percentages were 56 and 67 in 1959 and 81 to 96 in 1966.

Second, the capital gains component under the landlord standard has not been greatly different from that in annual return from farming so that the inclusion of these gains in the parity return standard and in annual returns from farming doesn't materially change the figures for all farms combined. Thus, returns from farming are only 3 percent higher in relation to the parity returns standard in 1959 and 1964, and only 2 percent lower in 1966 when capital gains were excluded.

The contribution of capital gains under the stockholder standard is relatively large. When these are included, returns from farming were 20 percent lower in relation to the parity returns standard in 1959; 11 percent lower in 1964; and 14 percent lower in 1966.

Parity Returns by Value of Sales

When the farms are divided into four major classes, according to value of sales, striking differences appear. For the larger farms--those with value of sales of $20,000 or more--returns from farming as a percentage of parity returns ranged from 61 percent to 92 percent in 1959 and from 107 percent to 167 percent in 1966.

Under the landlord standard, the ranges are narrower than under the stockholder standard. Under the landlord standard, the 1959 range is from 84 to 92 percent, and the 1966 range is from 107 to 129 percent. Under the stockholder standard, however, the 1959 range is from 61 to 129 percent while the 1966 range is from 112 to 167 percent. Under both standards, lower percentages of parity returns emerge when capital gains are included.

Further differences are evident as attention is focused on farms with a lower value of sales. One noticeable feature is the disappearance of returns which are as much as 100 percent of any of the four standards. Also, there is a rapid narrowing of the ranges between the various standards.

In the case of farms with value of sales of $10,000 to $19,999, returns from farming as a percentage of parity returns ranged from 54 to 83 percent in 1959 and from 84 to 98 percent in 1966. There was no instance in which these returns equaled or exceeded 100 percent of any of the parity returns. The closest approach was in 1966 under the stockholder standard, excluding capital gains, when the ratio of actual returns to parity was 98 percent.

These same characteristics are evident in the two smaller classes. For farms with value of sales in the $5,000 to $9,999 bracket, the range in 1959 was only from 46 to 62 percent and in 1966 was 62 to 70 percent. The latter percentage, which represents the stockholder standard excluding capital gains, was the highest attained, but still 30 percent below this particular standard.

The pattern is even more striking for farms with value of sales less than $5,000, particularly with respect to percentage of parity returns achieved. Even in the generally good year of 1966, the highest percentage attained was 43 percent under both the landlord and the stockholder standard, including capital gains. It is interesting to note that for this group of farms the inclusion of capital gains raises returns from farming as percentages of the parity returns standards in all but one instance. This is due to the shrinkage of realized net income in farming as compared with capital gains, even though these are computed from very low asset values.

Parity Returns in Relation to the
  Parity Price Ratio

Parity prices and the parity price ratio are often used as measures
of the economic situation in agriculture. For this reason, there is
interest in the relation of parity returns positions of farms to the
parity price ratio.

In 1966, the parity ratio was 80. This means that the per unit
purchasing power of farm commodities was 80 percent of what it was in
the base period 1910-14. The index of prices received by farmers was
265, while the index of prices paid was 334. This indicates that farm
prices would have had to be at least 25 percent higher to reach 100 per-
cent of parity prices. Actually, an even greater increase would have
been needed, because of related increases in food prices and the prices
of the resources purchased directly or indirectly from other farmers.
This causes the index of prices paid by farmers to rise slightly as farm
prices increase. When these adjustments are taken into account, it
appears that 1966 farm prices would need to have been about 33 percent
higher to have achieved 100 percent parity prices.

Again taking these adjustments into account, a much smaller increase
in farm prices--11 percent--would have been needed to provide 100 percent
of parity returns for all farms on the average. This assumes the landlord
standard, excluding capital gains, and no significant change in the
volume of goods sold. This standard could be reached with a parity ratio
of 86 as indicated in table 11.

Table 11.--Parity ratio required to provide 100 of parity returns and
           price change required to achieve this ratio, 1966

Value of Sales Class	:	Required change in prices received	:	Parity ratio 1/
$20,000 and over	:	- 9		73
$10,000-$19,999	:	+ 10		86
$5,000-$9,999	:	+ 38		103
Under $5,000	:	+ 170		167
All farms	:	+ 11		86

1/ Index of prices received by farmers divided by the index of prices
paid by farmers including interest, taxes, and farm wage rates.

It can also be seen from table 11 that 9 percent lower prices with a parity ratio of 73 percent would have been sufficient to provide parity returns to farms with value of sales of $20,000 or more. Farms with value of sales of $10,000 to $19,999 would have achieved parity returns in 1966 with prices received 10 percent higher averaging 86 percent of parity.

On the other hand, farmers with value of sales of $5,000 to $9,999 would have needed a 38 percent increase in prices received. Finally, farms with value of sales with less than $5,000 could have attained this particular parity return only if prices received had averaged 170 percent higher than prices in 1966.

This analysis indicates that the level of prices received by farmers relative to prices paid is only one factor in the achievement of returns from farming comparable to those obtained in other sectors of the economy. Of critical importance is the total value of sales, which in turn is largely a function of the amount of capital invested in land and other productive assets.

PARITY RETURNS FOR SELECTED FARMS BY TYPE
AND LOCATION

In Section III it was shown that in 1966 average realized net in-
come per farm was 81 percent of parity returns using the landlord
standard and excluding capital gains. Including capital gains, returns
from farming averaged 79 percent of parity returns standard. Farms
with value of sales of $20,000 or more averaged returns from farming
that exceeded parity returns. For all other farms, returns from farming
on the average fell short of parity returns. The next question is,
do parity returns positions vary from one type of farm to another?
Are some types of commercial family farms considerably worse off than
others in relation to parity returns standards?

Commercial Farms by Type, Size, and Location

To answer these questions, two different but parallel approaches
have been followed. The first approach is the application of the parity
returns concept to a number of the types of farms included in the
regularly published data on costs and returns of commercial farms by
type, size, and location. Costs and returns data for these commercial
farms have long been a part of the statistical program of the Department
of Agriculture. 6/

Data for these farms represent results of operations on typical
or representative farms of the specified type and size. The typical
farms are important operating units in the specified areas and in most
cases they are the most common units.

The same general procedures, methodology, and terms are used for
all types of farms. All these farms are assumed to be operated by full
owners with 100 percent equity. Thus, they provide data on costs and
returns on several types of commercial farms within a consistent frame-
work.

Parity returns have been calculated for 21 of these commercial farms
classified in 2 groups according to total income. There are 9 farms
in the group with total incomes of $20,000 or more and 12 in the group
with total incomes of $10,000-$19,999. Parity returns are measured for
these specific types of commercial farms in the same way as for farms
classified by value of sales as discussed in Sections II and III.

6/ Data on income and resources of these commercial farms through
1965 are published in Agr. Inform. Bul. No. 230, rev. Aug. 1966;
1966 data will appear in the next edition of this publication.

That is, the parity returns to operator and family labor are the same as in Section II. Parity returns to equity capital are measured according to the landlord standard including and excluding capital gains, and the stockholder standard including and excluding capital gains. The parity return to capital under the landlord standard is based on the rental rate of return of the state or states in which the specific type of farm is located. Also, capital gain under this standard is based on changes in value of farm real estate in the state in question. In Section II national average rental rates of return and farm real estate prices are used.

Returns from farming and returns from farming as a percentage of parity returns for these 21 types of commercial farms are shown in table 12. To minimize the influence of fluctuations in yields and prices, the data are presented as averages for the 3 years, 1964-66.

In the group of farms with total incomes of $10,000-$19,999, net farm income as a percentage of parity returns (landlord standard excluding capital gains) ranges from a low of 39 percent for Grade B dairy farms to a high of 89 percent for nonirrigated cotton farms in the high plains of Texas. None of these farms averaged 100 percent of parity returns for 1964-66 according to this standard.

The inclusion of capital gains does not materially alter the parity income positions of the illustrated farms except for the Bluegrass tobacco-livestock farm in Kentucky for which the increase is from 52 percent to 63 percent.

Under the stockholder standard, excluding capital gains, net farm income ranges from 41 to 120 percent of parity returns. Without exception, the percentage parity returns positions are higher than under the landlord standard excluding capital gains.

The inclusion of capital gains results in lower percentages of parity returns. In some cases, the reduction is small but in others it is substantial.

In general, returns from farming for the farms with total income of $20,000 or more are higher in relation to parity returns than for the group of farms with smaller incomes. However, the range of parity returns positions is extremely wide. Under the landlord standard excluding capital gain, that range is from a low of 71 percent for the hog-dairy farm to 328 percent for irrigated cotton-specialty farms in the San Joaquin Valley of California. For the San Joaquin Valley farm the parity returns position drops from 328 to 189 percent with the inclusion of capital gains. Inclusion of capital gains does not substantially affect the parity returns positions for the other types of farms.

Table 12.--Returns from farming and returns from farming as percentages of parity returns, specified type of commercial farm averages, 1964-66

Size of total income, type of farm and area	Returns from farming-- per farm			Returns from farming as percentage of parity returns			
	Net farm income	Capital gain 1/	Total	Landlord standard		Stockholder standard	
				Excluding capital gain	Including capital gain	Excluding capital gain	Including capital gain
	Dollars	Dollars	Dollars	Percent	Percent	Percent	Percent
Farms with total income of $20,000 and over:							
Hog-dairy, Corn Belt	10,312	1,364	11,676	71	71	89	65
Hog-beef fattening, Corn Belt	13,193	2,647	15,840	80	78	103	67
Cash grain, Corn Belt	14,660	4,958	19,618	105	101	133	79
Cotton:							
Mississippi Delta (large scale)	34,923	15,890	50,813	75	78	190	116
High plains, Texas (irrigated)	15,874	8,367	24,241	112	102	137	102
Cotton-specialty crop, Jan Joaquin Valley, California (irrigated)	57,281	19,034	76,315	328	189	334	179
Winter wheat farms:							
Wheat-pea, Pacific Northwest	18,988	6,189	25,177	81	82	127	78
Wheat-fallow, Pacific Northwest	16,697	4,744	21,441	91	90	112	73
Wheat-grain sorghum, southern plains	10,815	5,793	16,608	77	79	92	73
Farms with total income of $10,000 to $19,999:							
Dairy:							
Grade A, Eastern, Wisconsin	7,495	1,423	8,918	52	53	58	47
Grade B, Western, Wisconsin	4,700	740	5,440	39	41	41	37
Hog-dairy, southeastern Minnesota	5,698	1,509	7,207	45	48	49	44
Hog-fattening-beef raising, Corn Belt	6,346	1,902	8,248	49	53	65	53
Broiler-crop, Delmarva	7,275	3,078	10,353	78	78	90	82
Cotton:							
Black Prairie, Texas	5,381	3,523	8,904	59	67	68	67
High Plains, Texas (non-irrigated)	8,394	5,121	13,515	89	88	107	88
Tobacco, Coastal Plain, N.C.	5,964	1,719	7,683	67	71	86	74
Tobacco-cotton, coastal Plain, N.C.	5,788	1,897	7,685	61	66	79	69
Tobacco-livestock, Bluegrass, Ky.	8,017	5,908	13,925	52	63	80	72
Wheat-small grain-livestock, Northern Plains	9,501	2,458	11,959	84	81	120	91
Wheat, Southern Plains	10,307	3,842	14,149	75	77	92	67

1/ Based on estimated annual rate of change in the State price of farm real estate.

Under the stockholder standard, net farm income exceeds the parity returns on all but three of these nine types of farms. Two of these three farms are near 90 percent of parity returns.

Including capital gain materially reduces the parity returns positions for all these types of farms. Nevertheless, 3 of these 11 types of farms had returns from farming that exceeded the parity returns.

As is true for the smaller farms, there is variation in the parity returns positions of different types of farms producing the same commodity as well as variation among different types of farms in the same area.

Model Farms

The second approach to measuring parity returns for different types of farms in various areas was the simulation of model farms for five different types of farms in different types of farming areas.

The model farms were budgeted to produce specified levels of gross income under the price and yield conditions of 1965, representing different sizes of commercial family farms. The production, costs, and returns of these farms were calculated using local yields, resource requirements, and prices for the 3 years 1964-66. Parity returns standards were then calculated for each of the model farms, to determine whether farms of these sizes and types in the selected areas would have received parity returns on the basis of averages for the 3 years, 1964-1966.

The yields and practices followed by the top 25 percent of farm operators in the area were used as a guide in budgeting the model farms. They were purposely designed to measure the parity returns position of well organized, efficiently operated family farms of specific types producing specified levels of gross sales under 1965 yield and price conditions. In this way, if the model farm earns less than parity returns, the indication is that all or most of the commercial family farms of that general size, type, and location would be unable to attain parity returns. Conversely, if the model farm earns more than parity returns, the indication is that the more efficient family farms of this size, type, and location could attain parity returns.

The analysis was limited to family farms by imposing an upper limit of 3 man-years of labor, except for the Economic Class II tobacco farm, which uses about 4 man-years of labor. Budgets were prepared to reflect the prices, yields, and commodity programs in effect during 1964, 1965, and 1966. Model farms selected for Economic Classes II and III were those budgeted with gross sales of $30,000 and $15,000 at 1965 yields and prices and denote the midpoints of these classes. Four farming situations were represented by each of these classes, one was budgeted at the $60,000 level of gross sales, and one was budgeted only for $15,000 as shown below:

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Type and location of farm	:	Model farm budgets prepared for economic class of farm:				
	:	I ($60,000 gross sales)	:	II ($30,000 gross sales)	:	III ($15,000 gross sales)
	:		:		:	
Hog-grain, Illinois ......:		x		x		x
Tobacco, North Carolina ..:				x		x
Cotton, Mississippi Delta :				x		x
Wheat-livestock, Kansas ..:				x		x
Grade A dairy, Minnesota ..:						x

Although these farms were budgeted at specified amounts of gross sales under 1965 conditions, actual gross sales and gross farm income in 1964 and 1966 varied widely from the specified amount as the result of differences in yields, prices, and government programs. For example, gross incomes of the Kansas wheat-livestock farms in 1966 were around $25,000 and $51,000, respectively. However, by using averages for the 3 years much of the year-to-year variation has been eliminated.

Specific assumptions used in developing the model farm budgets are as follows:

(1) It was assumed that farms in Economic Class I (budgeted with $60,000 gross sales) have 60 percent equity in the total value of their real estate and other capital, excluding rented land. Farms in Economic Class II ($30,000 gross sales) were assumed to have 75 percent equity, and those in Economic Class III ($15,000 gross sales), 90 percent equity. These percentages seem to be reasonable for the areas and types of farm considered in these six farming situations.

(2) Net farm income was calculated as gross farm income minus total production expenses, including interest on the nonequity or borrowed portion of the farm capital.

(3) Capital gain on farm real estate was calculated for each year by the same procedure described earlier.

For each type of farming situation, parity returns were calculated according to the landlord and the stockholder standard including and excluding capital gains. Rates of return to operator and family labor are those discussed in Section II and are the same for all types of farms.

Under the landlord standard, the return to capital is the rental rate of return for the state in which the farm is located. Similarly, capital gain is calculated on the basis of prices of farm real estate for that state. These rates of rental return and capital gain are shown below:

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	Net rental rate of return			Capital gain on farm real estate		
	1964	1965	1966 1/	1964	1965	1966
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
Illinois ....:	4.5	4.8	5.1	3.0	3.1	3.4
North Carolina ..:	8.9	7.2	6.7	4.2	4.6	4.8
Mississippi .....:	12.9	11.4	10.9	6.0	5.9	6.0
Kansas ....:	4.7	5.1	5.6	3.6	3.7	3.9
Minnesota ....:	4.9	4.7	5.4	4.2	3.6	3.1

1/ Preliminary.

Under the stockholder standard, the annual rate of return is the same as used in Sections II and III.

Annual returns from farming including and excluding capital gains and returns from farming as percentages of parity returns for these five model farms are shown in table 13. Averages for 1964-66 are shown for the several different sizes of farms. Incomes and resources of these model farms are summarized in table 14.

Under the landlord standard excluding capital gains, net farm income ranges from a low of 35 percent of parity returns for the smaller cotton farm to a high of 105 percent for the largest hog-grain farm. Only for the hog-grain farm does net income exceed parity returns. The two cotton farms reflect the most unfavorable parity returns positions with net incomes that average around 35 percent of parity returns. The hog-grain farms show progressively improved parity returns positions moving from 43 percent for the smallest of these farms to 74 percent for the next larger and to 105 for the largest. For the wheat-livestock and dairy farms, 1966 is the best year of the three, and its inclusion materially increases the average.

The inclusion of capital gains improves the parity returns position of both of the cotton farms. For the other farms the inclusion of capital gain does not greatly change the parity returns percentages.

Under the stockholder standard, excluding capital gains, net farm income ranges from 48 to 144 percent of parity returns. Net farm income on five of the farms--the largest hog-grain farm, both cotton farms, and both wheat-livestock farms--exceeds parity returns. As under the landlord standard, the inclusion of capital gains improves the parity returns position for the smaller cotton farm. The parity

Table 13.--Returns from farming and returns from farming as percentage of parity returns, model farms of selected types and location, averages, 1964-66

Type and location of farm	Approximate gross income 1965	Returns from farming			Returns from farming as percentage of parity returns			
		Net farm income	Capital gain 1/	Total	Landlord standard		Stockholder standard	
					Excluding capital gain	Including capital gain	Excluding capital gain	Including capital gain
	Dollars	Dollars	Dollars	Dollars	Percent	Percent	Percent	Percent
Hog-grain, Illinois	15,000	4,217	1,134	5,351	43	47	48	43
	30,000	8,385	2,298	10,683	74	75	92	73
	60,000	16,612	3,605	20,217	105	97	144	106
Tobacco, North Carolina	15,000	7,997	2,370	10,367	79	81	110	91
	30,000	15,037	4,537	19,574	87	87	141	112
Cotton, Mississippi Delta	15,000	5,247	3,271	8,518	35	45	57	62
	30,000	6,151	4,273	10,424	36	47	81	82
Wheat--livestock, Kansas	15,000	8,272	3,690	11,962	78	79	108	72
	30,000	16,795	7,142	23,937	85	83	121	87
Grade A dairy	15,000	4,861	846	5,707	71	69	81	65

1/ Based on average rate of change in State prices of farm real estate.

Table 14.--Incomes and resources, model farms of selected types and locations, averages, 1964-66

Type and location of farm	Size--approximate gross income, 1965	Value of equity assets 1/	Acres in farm	Amount of labor used			Farm income	
				Operator and family	Hired	Total	Gross	Net
	Dollars	Dollars		Hours	Hours	Hours	Dollars	Dollars
Hog-grain, Illinois	15,000	45,237	140	3,080	200	3,280	14,293	4,217
	30,000	70,282	121	2,600	300	2,900	28,245	8,385
	60,000	95,221	296	3,400	1,200	4,620	53,230	16,612
Tobacco, North Carolina	15,000	52,942	131	2,552	2,618	5,170	16,561	7,997
	30,000	86,780	266	3,320	5,275	8,595	33,164	15,037
Cotton, Mississippi Delta	15,000	56,712	240	3,198	---	3,198	15,109	5,247
	30,000	64,494	415	2,040	3,940	5,980	26,727	6,151
Wheat-livestock, Kansas	15,000	111,696	1,586	1,707	159	1,866	19,135	8,272
	30,000	117,956	3,174	3,330	316	3,646	38,311	16,795
Grade A dairy, Minnesota	15,000	34,185	131	2,000	50	2,050	16,130	4,861

1/ Farms with approximately $15,000 income in 1965 were assumed to have 90 percent equity in their assets, those with $30,000, 75 percent, and those with $60,000, 60 percent.

returns percentages of most of the other farms are reduced. Despite
the reductions, returns from farming on the largest hog-grain farm
and the larger tobacco farm exceed parity returns.

It is statistically possible to measure the parity returns position
of different types of farms as has been shown by the examples used in
this section. However, there is considerable variation in types and
sizes of farm organizations producing the same commodities in different
areas of the country, and there are also variations in farms producing
different commodities within the same area.

Despite the variation among different types of farms it appears
that larger farms tend to have more favorable parity returns positions
than smaller farms of the same type, and returns on types of farms that
use large amounts of operator and family labor tend to be low relative
to parity returns. Any comparison of the parity returns positions of
different types of farms must take into account the amount of capital
and labor required by the different types.

SECTION V

INTERPRETATION AND USE OF PARITY RETURNS CALCULATIONS

The basic element in parity returns calculations in this study is the comparison between two values--net farm income or returns from farming and the amount of income or returns that comparable resources earn in other employment. This comparison indicates whether or not farmers' resources are earning as much in farming as they could be expected to earn in the nonfarm economy. We have examined how parity returns standards could be applied to groups of farms such as the various economic classes of farms (as measured by gross value of sales). We have also examined the application of parity returns standards to selected types of farms in various locations.

This section focuses on the uses and limitations of the parity returns standards. In addition, it discusses the relation of these statistical standards to policy questions.

Parity Returns Standards in Relation to Total Family Income

In the interpretation and use of parity returns analysis, it is important to keep in mind the conceptual differences between returns from farming, total family income, and parity returns. Parity returns are designed as measures of the equity of returns from farming. Off-farm income is disregarded. This means that average family income of a group of farmers might be relatively high even though the returns from farming were less than parity rates of return for their labor and capital. Conversely, a group of farms with limited resources could have relatively low incomes even though the farms were receiving parity rates of return for labor and capital. The important point is that parity returns relate to returns from farming as such--not the total income of farm families from all sources.

Parity Returns as a Measure of General Financial Wellbeing

Parity return calculations have been presented based on several different methods of measuring the return on farm capital, both including and excluding capital gains. When one is interested in the farmers' overall financial condition, including both current net income and changes in net worth, then capital gains must be taken into account in appraising the actual situation and comparing it with invest-ment and employment alternatives. This approach is particularly appropriate when the focus is on earnings in agriculture over the longer-run. The parity returns standard which provides the best measure for this purpose appears to be the landlord standard, as it reflects the wage or salary income the farmer could expect to earn if he left the farm and took a nonfarm job, plus net rental income and capital gains.

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For some purposes, the use of parity returns calculations, excluding capital gains, may be appropriate. This is particularly true in the short-run when the object is to measure year-to-year changes in farm income and the direct effects of farm programs on farm prices and income. Here also the landlord standard is preferable since the capital gains component in returns from farming is more nearly comparable to the capital gains component in parity returns than is true for the stockholder standard.

It should be emphasized, however, that parity returns calculations for all farms combined or for farms classified by value of products sold provide only general measures of the economic position of agriculture compared to the economic position in the nonfarm sectors of the economy.

Because of the wide variation among farms in income, size, and resources, aggregates and averages provide much less than we need to know about the income situation in agriculture. More precise measures would require the calculation of parity returns which take into account the variation in farm size, together with the amounts of capital and labor that are actually being employed.

Need for Improvement of the Data Used in Calculating Parity Returns

Much of the basic data used in the calculation of parity returns and the estimates of income and expenses by value-of-sales classes are drawn from the 1959 and 1964 Census of Agriculture and the 1960 Sample Survey of Agriculture. But many of the statistics required for establishing parity returns standards and measuring the parity returns positions of commercial family farms are not available from the Census or any other source.

It has been necessary to resort to bits and pieces of information from various sources. These data have been supplemented by rough approximations of a number of important variables and are therefore subject to a wider range of error than is generally considered acceptable in farm income estimates. The measures of parity returns positions included in this report should be considered as rough approximations rather than as precise measures.

If parity returns positions were adopted as a primary measure of economic wellbeing of farmers, provision would have to be made for the regular collection of the data needed to maintain the estimates on a current basis with an acceptable degree of accuracy, rather than depending on incomplete benchmark data that are available only at 5-year intervals. The use of such data would involve serious risk that substantial revisions would be needed periodically. Such revisions could seriously impair public confidence in the accuracy and objectivity of the parity returns calculations.

Parity Returns by Type of Farm

A number of complex problems would be encountered in determining parity returns standards for specific types of farms in specific areas. The data necessary for these calculations are not readily available and their acquisition would be both time consuming and expensive. Data on farm production expenses would need to reflect current practices and conditions in the specific areas. Since farming is changing so rapidly from year to year and farms vary so widely, detailed expensive surveys of farm operators in specific areas would have to be carried on continuously.

Thus, although measures of the parity returns of specific types of farms in specific areas might provide some additional information, we doubt that the additional information would justify the expense.

Parity Returns as a Basis of Commodity Prices

At least in theory, parity returns could be translated into sets of commodity prices which, together with assumed patterns of production and sales, would be consistent with parity returns. It is not recommended that this be done. Price formulas derived from parity returns would involve a new set of complicated calculations which would have severe limitations. Extreme difficulty would be involved in estimating several crucial quantities for separate commodities, such as the value of commodity sales and prediction of changes in demand, yields, production costs, and other factors affecting the net farm income earned in the production of these commodities. Furthermore, such a procedure would materially restrict the flexibility required for effective and efficient administration of commodity supply and price support programs. Price-support levels based on prices derived from parity returns would not provide an adequate and automatic guide to program decisions.

Parity Prices as a Program Objective

Parity prices have been directly involved in the administration of commodity programs since the early thirties. The parity ratio is often used as a general measure of changes in the economic situation of agriculture. Also, some persons seem to think that parity prices provide a unique and completely satisfactory guide for programs designed to improve the economic position of agriculture. Therefore, an understanding of what the parity price formula measures is needed.

Parity prices are prices that would maintain the per unit purchasing power of farm products in terms of goods and services farmers buy that existed in the base period 1910-14. The parity price formula has been modernized by basing the pattern of relationships among the parity prices on the actual price relationships during the immediately preceding 10

years. The general relationship between price received and price paid remains that of 1910-14, the same as when it was originally incorporated in legislation more than 30 years ago.

Prices received and prices paid by farmers are important factors in net farm income. Quantities are equally important--quantities of farm products sold, and kinds and quantities of goods and services farmers buy. Over a period of years, as farms become larger and as farm technology and yields change, prices and price ratios alone provide a less and less accurate barometer of the financial wellbeing of farmers. Nonetheless, the parity price formula omits consideration of the quantity factors related to farm income.

If parity prices were limited to measures of purchasing power over relatively short periods of time, or if the quantities bought and sold varied only slightly over time, then parity prices could serve as reasonably acceptable measures of the economic situation in agriculture. Actually, the facts fit neither of these two conditions. Parity prices are used to measure purchasing power in relation to 1910-14, a period more than half a century in the past. In that half century both farm output and the volume of purchased inputs have more than doubled, and there is every indication that they will continue to increase.

Neither the index of prices received by farmers nor the parity ratio take direct payments to farmers into consideration. The use of these payments in government farm programs has increased substantially in recent years. Because of this it has been desirable to publish an adjusted parity ratio that incorporates direct payments. Omission of direct payments is another limitation of the parity ratio as a measure of the economic situation in agriculture.

Another problem associated with parity price formulas involves the price indexes. Index numbers are a standard statistical technique for measuring changes in prices. Index numbers most accurately measure changes in situations in which the items included and their relative importance remain fairly constant. The accuracy of a price index decreases as the items included in the index and their relative importance change. The construction and calculation of an index to measure changes in prices received and prices paid by farmers from 1910-14 requires numerous statistical compromises that tend to reduce the accuracy of the indexes. One way to minimize this problem would be to use a fairly recent base period that is shifted forward on a regular periodic basis. The Office of Statistical Standards encourages statistical agencies of the Federal Government to use a recent base (currently 1957-59) for index numbers where possible.

The 1910-14 period (or August 1909-July 1914) was used as the reference base for indexes developed in the 1920's. The indexes measure prices received and prices paid by farmers. This period was

specified as the base period for the computation of parity prices in the Agricultural Adjustment Act of 1933. At that time, the period of 5 years immediately preceding World War I was appropriately considered to be a representative base period for price comparisons. In 1933, the technological revolution in agriculture had hardly begun and its impact was not readily apparent.

Since 1933, there have been numerous proposals for changing the parity price formula. Different base periods such as 1919-29 and 1934-39 were adopted for certain commodities. A comparable price formula was included in legislation and was used for certain commodities during the World War II period. The patterns of parity price relationships were modernized by the use of the immediately preceding 10 calendar years. Use of the immediately preceding 10 calendar years eliminated the need for special base periods of specific commodities, and continues the use of 1910-14 as the general base period.

Other changes in the parity price formula have been proposed, but have not been accepted. With the parity price base period fixed at 1910-14, the relationship between the parity ratio and net farm income becomes less and less direct.

Moving the base period for the parity price formula to a recent period that is more nearly representative of modern day American farming would provide a better purchasing power formula. However, a base period that might be considered representative at the time it was selected, would gradually become obsolete unless provisions were made for periodic review and updating. Even if this were done the parity price formula would still suffer from the defect that it is limited to prices and ignores quantities and direct payments.

Criticism of the parity price formula should not be construed as questioning the usefulness of farm price data. Measures of prices received by farmers and prices paid by farmers were collected and published even before they were incorporated in the parity formula. They would still need to be collected and published, even if they were no longer incorporated in such a formula. They are standard tools of economic analysis.

Limitations of Parity Measures for Answering Policy Questions

When the parity concept was first incorporated into farm legislation, the Congress recognized that a great deal of discretion and latitude had to be used in developing and administering programs involving this objective. This is still the situation. Effective commodity programs must take into account not only what might be indicated by various formulas, but also what is feasible in terms of demand and supply, political and farmer acceptability, program costs and administrative complexities.

A parity formula--whether in terms of welfare, income, or prices--
can be useful as a general measure of farmers' economic situation. It
can also be useful as a general guideline in examining the need for
and general effectiveness of commodity programs. But no formula or
set of formulas, regardless of the implied precision of the calculations,
can automatically provide specific answers to policy questions.

PART 1: DERIVATION OF ECONOMIC CLASS DISTRIBUTIONS USED IN PARITY RETURN CALCULATIONS

The procedure used in distributing aggregates of income, expenses, and resources by economic class, for the years 1959 through 1966, consist of four main steps:

(1) The distribution of the number of farms by economic class is estimated;
(2) Per farm averages for income, expenses, and resources by economic class are derived;
(3) The per farm averages for each of these items are multiplied by the number of farms in each class, yielding a first approximation of the distribution, and;
(4) The control totals (the aggregates for the year in question) are distributed in proportion to the first approximations obtained in step 3.

This distribution procedure is illustrated in table 1.

Table 1.--Derivation of the distribution of cash receipts from farm marketings by economic class of farm, 1966

Economic class	Number of farms	Average value of sales 1/	First approx-imation: Col. 1 x Col. 2	Col. 3 adjusted to con-trol total
	Thou.	Dol.	Mil.dol.	Mil.dol.
Commercial farms:				
Class I, $40,000 and over	193	108,954	21,028	21,064
Class II, $20,000 - $39,999	334	27,263	9,106	9,121
Class III, $10,000 - $19,999	510	14,104	7,193	7,205
Class IV, $5,000 - $9,999	446	7,211	3,216	3,222
Class V, $2,500 - $4,999	356	3,614	1,287	1,289
Class VI, $50 - $2,499	114	1,265	144	144
Other farms:				
Class VII, Part-time	911	770	701	702
Class VIII, Part-retirement and Class IX, Abnormal	388	1,213	471	472
All Farms	3,252		43,146	43,219

1/ Class I average derived by projecting the trend between 1959 and 1964 to 1966. The 1964 averages are used for each of the other classes.

In the methodology employed in this report, the year to year changes in the percentage of farms in each economic class are primarily responsible for changes in the distributions of the other aggregates. Year to year variations in the rate of change in the per farm averages by economic class also influence the distributions.

The estimates of the number of farms and the per farm averages in each economic class are based on benchmark estimates developed for 1959 and 1964. The major sources of information on incomes and resources in these years, by economic class, is the 1959 Census of Agriculture, the 1960 Sample Survey of Agriculture and preliminary data from the 1964 Census of Agriculture. These sources of data have been supplemented by rough approximations of a number of important variables which were not available from the agricultural censuses. In years other than 1959 and 1964, estimates of the number of farms and per farm averages are based on an analysis of trends observed between 1959 and 1964.

The following paragraphs include explanations of the methods used to derive (1) the distributions of farms, (2) benchmark distributions and per farm averages of incomes and resources and (3) projections of these benchmarks to 1966. Sources are also given for control totals obtained outside the Farm Income Branch.

Number of Farms by Economic Class, 1959-1966

The distributions of farms by economic class in 1959 and 1964 are based on data obtained from the 1959 Census of Agriculture and preliminary data from the 1964 Census of Agriculture. For 1959, the census distribution was first adjusted class by class for underenumeration and then adjusted proportionately to the Department of Agriculture's official estimate of the number of farms. An adjusted distribution for 1964 was obtained by adding the difference between the official 1959 percentage distribution and the 1959 census percentage distribution to the 1964 census distribution.

The percentage distributions of farms by economic class for 1960-1963 were derived by calculating for each class the change in the proportion of all farms in these classes between the benchmark years 1959 and 1964, and then relating these changes to the change in the U.S. average value of sales per farm between 1959 and 1964. These relationships were used to calculate for each class the annual changes in the proportion of all farms in these classes based on the annual change in the U.S. average value of sales per farm. Official control totals of the number of farms were then applied to the estimated percentage distributions to obtain the number of farms by economic class for each year.

Relating changes in the proportion of all farms in each class to changes in the U.S. average value of sales is consistent with the assumption made concerning the changes in the individual class averages. It was assumed that annual changes in the class averages were fairly constant and did not differ greatly from the 1959-1964 implied annual rates of

change that result from accepting the 1964 benchmark distribution of number of farms and cash receipts. This method was used in a effort to minimize the deviation of these averages from the 1959-1964 trend.

Projections of the 1959-1964 trend in the distribution of the number of farms to 1965 and 1966 were derived by a method similar to the one used for estimating the distributions for years between the two benchmarks (1960 to 1963). The footnotes in table 2 outline this method.

The relationships between changes in the percentage distribution and the U.S. average value of sales used to estimate annual changes in the proportion of farms in each class for the years 1960 to 1963 are also used to obtain first approximations for years subsequent to 1964. The first approximation of the percentage distribution of farms in 1966 could have been used as the final estimate if the 1959-1964 trend in the average value of sales in each class had been allowed to continue to 1965 and 1966. The 1959-1964 trend was allowed to continue only for the Class I average. The downward trend in the other class averages was terminated in 1964 so that the projections to 1965 and 1966 would not cause the averages for closed interval value of sales classes to differ unreasonably from the midpoints of these classes.

The final estimates for 1966 were derived by computing the estimating relationships, in the same manner as similar relationships were computed for the 1959-1964 period. The percentage distribution of farms in 1966 was computed using these new relationships and the 1966 U.S. average value of sales. The Class I average was recomputed as $108,954. Final average value of sales estimates were computed from the aggregate estimates of cash receipts and number of farms in table 2 showing the derivation of the distribution of cash receipts from farm marketings by economic class, U.S., 1966.

Similar estimates were made for 1965 using the final 1964-1966 estimating relationships.

Benchmark Estimates of Gross Income by
  Economic Class of Farm

Cash Receipts from Farm Marketings Excluding Government Payments. The average value of farm products sold as reported in the 1960 Sample Survey of Agriculture was used in the first approximation of the distribution of cash receipts for 1959. Preliminary data from the 1964 Census of Agriculture was used for 1964.

The 1960 averages were used for the 1959 estimates of cash receipts in order to maintain consistency between the cash receipts distribution and the distributions of production expenses, value of assets owned by farmers and amount of debt owed on these assets derived primarily from the 1960 Sample Survey.

Table 2.--Percentage distribution of farms and average value of farm products sold by economic class, 1959, 1964, and 1966

Economic class	1959		1964 3/		1966 Estimates			
					First approximation:		Final estimate 6/	
	Percent of farms 1/	Average value of sales 2/	Percent of farms	Average value of sales	Percent of farms 4/	Average value of sales 5/	Percent of farms	Average value of sales
	Pct.	Dol.	Pct.	Dol.	Pct.	Dol.	Pct.	Dol.
Commercial farms:								
Class I, $40,000 and over	2.587	99,991	4.327	104,647	6.147	109,516	5.937	109,140
Class II, $20,000 to $39,999	5.345	27,311	7.902	27,263	10.576	27,263	10.267	27,308
Class III, $10,000 to $19,999	12.277	14,276	14.044	14,104	15.892	14,104	15.679	14,127
Class IV, $5,000 to $9,999	16.915	7,443	15.256	7,211	13.521	7,211	13.721	7,224
Class V, $2,500 to $4,999	15.963	3,703	13.356	3,614	10.630	3,614	10.945	3,621
Class VI, $50 to $2,499	10.007	1,446	7.907	1,265	3.084	1,265	3.492	1,263
Other farms:								
Class VII, Part-time	25.336	906	25.450	770	28.196	770	28.027	771
Class VIII, Part-retirement	11.570	1,344	11.758	1,213	11.954	1,213	11.931	1,216
Class IX, Abnormal								
All farms	100.000	8,179	100.000	10,671	100.000	13,617	100.000	13,290

1/ Based on data from the 1959 Census of Agriculture after adjustment for underenumeration of farms.

2/ Based on data from the 1960 Sample Survey of Agriculture after adjustment to the official control total of cash receipts.

3/ Derived from preliminary data from 1964 Census of Agriculture after adjustment for underenumeration and for consistency with official control totals.

4/ Estimated from 1959-1964 observed relationships between changes in the percent distribution of farms and the U.S. average value of sales.

5/ The first approximation of the Class I average for 1966 was estimated from the 1959-1964 observed relationship between the change in the Class I average and the U.S. average value of sales. The other class averages were assumed to equal the 1964 class averages in this first approximation. The all farm average is the percentage weighted average of the individual class averages.

6/ Based on estimating relationships derived from differences between the 1966 first approximations and the 1964 benchmark estimates of the percentage distribution of farms and the average value of sales. The average value of sales estimates were finally adjusted to make them consistent with the official control total of cash receipts.

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Government Payments

Per farm averages of Government payments used in the first approximations of the distributions of government payments for all years were those derived from unpublished data from a special tabulation of the farms included in the 1961 Consumer Expenditures Survey. The reported averages in that year were adjusted, where necessary, by applying the relationship between Government payments and farm sales shown in the survey to the official estimates of sales by economic class.

Home Consumption. Per farm averages of the value of home consumption of farm products used in the first approximations for all years were those originally derived from data published in the 1945 Census of Agriculture.

Gross Rental Value of Farm Dwellings. Averages used in the first approximations of the imputed rental value of farm dwellings in all years were per farm averages of housing expenditures derived from the 1955 Farmers' Expenditures Survey. These expenses include real estate taxes, insurance premiums, mortgage interest charges, and repairs. Average housing expenses for commercial farms according to the 1959 Census were derived from the 1955 data by determining the relationship between the reported per farm expenses and the corresponding midpoints of the 1955 value of sales intervals and then applying this relationship to the 1959 value of sales intervals. Average expenditures for the other farms (part-time, part-retirement, and abnormal) were assumed to differ from the Class VI commercial farm average in accordance with the differences in the per acre value of land and buildings as shown in a special tabulation of data obtained in the 1960 Sample Survey of Agriculture.

Operators' Gross Farm Income. Gross farm income of operators is computed as realized gross farm income (sum of cash receipts, Government payments, value of home consumption, and rental value of farm dwellings) minus the gross income accruing to nonfarm landlords. Per farm averages of gross farm income of all landlords were used to obtain estimates of the gross income of nonfarm landlords only in 1959. These averages were derived from data from the 1960 Sample Survey of Agriculture published in Farm Debt by the Board of Governors of the Federal Reserve System. They include cash rent paid to landlords plus the landlords' share of the value of livestock and crop sales.

The 1964 gross income of nonfarm landlords was derived by computing the ratios of gross farm income of nonfarm landlords to the value of land and buildings operated in 1959 and multiplying these ratios by the 1964 estimates of the value of land and buildings to obtain a first approximation.

Benchmark Estimates of Production Expenses
by Economic Class of Farm

Production Expenses in 1959. Production expenses in 1959 were
derived by making separate estimates of (1) cash expenses of operators,
(2) operators' depreciation, and (3) net rent to nonfarm landlords and
all landlord expenses.

(1) Operators' cash expenses.--The distribution was made by using
per farm averages of operators' share of cash operating ex-
penses as published in the 1960 Sample Survey of Agriculture.

(2) Operators' depreciation and other capital consumption.--Per
farm averages of depreciation, by economic class of farm,
were derived from tax return data published in Statistics of
Income--1962, U.S. Business Tax Returns. The derivation was
based on an analysis of the relationship between depreciation
and size of business receipts as reported by sole farm pro-
prietors; farm partnerships; and agriculture, forestry, and
fishery corporations. Depreciation on dwellings was assumed
to be distributed in proportion to the estimated gross rental
value of dwellings, as previously discussed.

(3) Net rent to nonfarm landlords and all landlord expenses.--Net
rent and expenses of both farm and nonfarm landlords were
assumed to be distributed in proportion to the gross income
of all landlords. (See derivation of operators' gross farm
income.)

Production Expenses in 1964. Production expenses in 1964 were derived
by making separate estimates of the distributions of eleven individual ex-
pense items and an "all other" expense category. Seven of the eleven individ-
ual expense distributions were based on census or survey estimates of the
specific items in 1964. The other distributions were based on related
information in the 1964 Census of Agriculture or on estimates in other years
or from other sources.

(1) Seven specified expenses for 1964. The seven specified expenses
which were reported by economic class for 1964 are feed, seed,
fertilizer, petroleum, pesticides, livestock, and wages paid
hired labor. The reported distributions were used to obtain
approximations which were then adjusted to the appropriate
control totals. All of these expenses, except pesticides,
were reported in the 1964 Census of Agriculture. The pesti-
cides distribution was reported in Farmers' Expenditures for
Pesticides in 1964, Agric. Econ. Report No. 106.

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(2)   Interest.   A first approximation of the distribution of total
      interest expenses was derived by computing the ratios of total
      interest in 1959 to value of total assets operated in 1959,
      and applying these ratios to the 1964 estimates of value of
      total assets.

(3)   Depreciation.   Per farm estimates of total depreciation in
      1959 were used to obtain a first approximation of the distri-
      bution of depreciation in 1964.

(4)   Net rent to nonfarm landlords.   A first approximation of the
      distribution of net rent to nonfarm landlords was obtained by
      first computing the ratios of net rent to value of assets owned
      by nonfarm landlords in 1959 and then applying these ratios to
      the 1964 estimate of nonfarm landlord assets.   The value of
      nonfarm landlord assets was computed as the difference between
      value of assets operated by farmers and the value of assets
      owned by farmers.   (See section on derivation of operators'
      equity assets).

(5)   Taxes on farm property.   Taxes on farm property were assumed
      to be distributed in proportion to the value of land and
      buildings operated.

(6)   All other expenses.   A first approximation of the distribution
      of other expenses was obtained by first computing the ratios
      of other expenses to all specified expenses, except interest,
      taxes, net rent, and hired labor in 1959 and then applying
      these to the 1964 estimate of the same specified expenses.
      Additional 1959 detailed expense estimates required in this
      calculation were derived from data reported in the 1959 Census
      of Agriculture by the same methods used for these items in
      1964.   The 1964 per farm pesticides expense estimates were
      used to obtain a first approximation of the pesticides expense
      distribution in 1959.

Benchmark Estimates of Productive Assets
   by Economic Class of Farm

     Total Productive Assets in 1959.   The distribution of total assets
in 1959 was obtained by making separate estimates for (1) value of real
estate, (2) value of livestock on farms, (3) value of motor vehicles and
machinery on farms, (4) working capital, and (5) feed crop inventories.

(1)   Value of real estate--The distribution was obtained by using
      the average value of land and buildings operated by economic
      class of farm as derived from 1960 Sample Survey of Agricul-
      ture data published in Farm Debt by the Board of Governors of
      the Federal Reserve System.

(2)   Value of livestock on farms--The distribution was obtained by
       using per farm livestock values derived from distributions
       of the number of various kinds of livestock as reported in
       the 1959 Census of Agriculture. Each animal was given the
       U.S. average inventory value for livestock on farms as of
       January 1, 1959, as reported by the Statistical Reporting
       Service.

(3)   Value of motor vehicles and other farm machinery and equipment--
       The distribution of the value of machinery and equipment was
       derived from the estimated distribution of operators' depre-
       ciation after an adjustment to exclude depreciation on service
       structures and include landlords' farm machinery and equipment
       depreciation.

(4)   Working capital--The distribution was assumed to be the same
       as the distribution of operators' cash operating expenses.

(5)   Feed crop inventories--Based on the estimated distribution of
       the value of livestock including horses and mules, and the
       distribution of acres of corn and hay harvested as shown in
       the 1959 Census of Agriculture.

Total Productive Assets in 1964. The distribution of total assets
in 1964 was obtained by making estimates of the same five items estimated
for 1959. The methods used in 1964 were the same as in 1959 for the
estimates of (1) value of real estate, (2) value of livestock on farms,
and (3) value of motor vehicles and other farm machinery and equipment.
The 1964 Census of Agriculture was the source of information for the
distribution of these items in 1964.

The working capital distribution in 1964 was obtained by first
computing the ratios of working capital to total expenses excluding
interest, depreciation and net rent in 1959 and then applying these ratios
to the 1964 estimates of the same group of expenses by economic class of
farm. This first approximation was then adjusted to the official control
total for working capital.

The first approximation of the distribution of feed crop inventories
in 1964 was obtained by computing the ratios of feed crop inventory to
livestock on farms in 1959 and then applying the ratios to the 1964 esti-
mates of value of livestock on farms.

Operators' Equity Assets in 1959. Equity assets of operators are
defined as total productive assets used in agriculture minus assets of
nonfarm landlords and farm operators' debt. The distribution in 1959 was
obtained by making separate estimates of (1) value of real estate operated,
(2) value of real estate rented from nonfarm landlords, (3) amount of real

estate debt owed by farmers, (4) value of other assets owned by farmers, and (5) amount of other debt owed by farmers.

(1) Value of real estate operated.--This is the same as the value of real estate discussed in the section on total productive assets.

(2) Value of real estate rented from nonfarm landlords.--This distribution is obtained by using per farm averages derived from 1960 Sample Survey of Agriculture data for (a) value of real estate operated, (b) value of real estate owned, and (c) net income from rental of farm property to others. The net income from rental of farm property to others was used to distribute the value of real estate rented to other farmers. The value of real estate rented from others was calculated as (a) value of real estate operated plus (b) value of real estate rented to other farmers minus (c) value of real estate owned. The value of real estate rented from nonfarm landlords was distributed in proportion to the value of real estate rented from others.

(3) Real estate debt owed by farmers.--Real estate debt owed by farmers (operators and farm landlords) was derived from per farm averages of total agricultural debt owed by operators and by landlords as reported in the 1960 Sample Survey of Agriculture.

(4) Value of other assets owned by farmers.--Other assets owned were distributed in proportion to the total value of other assets. (See section on total productive assets.)

(5) Other debt owed by farmers.--Other debt and real estate debt are both distributed in proportion to the total agricultural debt of farmers. (See explanation of real estate debt.)

Operators' Equity Assets in 1964. Separate estimates were made for the distributions of the value of (1) real estate owned by farmers, (2) other assets owned by farmers, (3) operators' equity in real estate, and (4) operators' equity in other assets. First approximations of these items were derived by first computing the ratios of these items in 1959 to the value of these items operated in 1959 and then applying the ratios to the 1964 estimates of the value of these items operated by farmers.

Benchmark Estimates of Labor Used in Farm Production by Economic Class of Farm

Operator and Family Labor. The 1959 and 1964 distributions of the number of hours worked by operators is obtained by estimating full-time man equivalents per farm in each class from data shown in the 1959 Census of Agriculture and from preliminary information from the 1964 Census of Agriculture. These man equivalents are estimates of the availability of operator labor based on (1) the distribution of operators by number

of days worked off the farm operated, (2) the number of operators 65 years of age or over, and (3) the number of farms operated by hired managers. An operator was assumed to be 85 percent available if he worked off the farm 1 to 99 days, 50 percent available if he worked 100 to 199 days off the farm, 15 percent available if he worked off the farm 200 days or more, and 100 percent available if he did not work, or did not report working, off the farm any days during the year. One-half a man equivalent was deducted for every operator over 65 years of age and one man equivalent was deducted if the farm was operated by a hired manager. The per farm man equivalents were used to obtain a first approximation of the distribution of labor, which was then adjusted to a control total of hours required.

Because operators of Class VI farms are defined as being at least 85 percent available on the basis of number of days worked off the farm, and because by definition they are less than 65 years of age, an arbitrary reduction of the calculated man equivalents was made in order to reflect more closely the labor required on Class VI farms.

Man equivalents of unpaid family members were estimated from data shown in the 1954 Census of Agriculture. A special report, Farmers and Farm Production in the United States, includes a table showing man equivalents of unpaid family members by economic class calculated on the assumption that these workers were equal to 0.5 man equivalent if they reported working 15 hours or more in the specified week.

Income and Hours Worked by Hired Farm Workers. The 1959 and 1964 distributions of wages paid hired farm workers were obtained by using per farm averages of wages paid as reported in the 1959 Census of Agriculture and the 1964 Census of Agriculture. First approximations of the distributions of hours worked were obtained by dividing the wages paid hired workers in each class by an estimated per hour wage rate for each class. These differential wage rates were estimated by converting to a per hour basis the wage rate reported in the 1959 Census of Agriculture for workers paid on a daily, weekly, and monthly basis. A weighted average per hour wage rate for all workers was then computed for each economic class.

Estimates of Incomes and Resources in 1966
by Economic Class of Farm

Most of the important income and resource items needed for the parity return calculations in 1966 were estimated by first computing the 1964 ratios of these items to gross farm income excluding Government payments by economic class and then multiplying these ratios by the 1966 estimates of gross farm income excluding Government payments. The first approximations of the various distributions by economic class obtained by these multiplications were then adjusted to their respective official control totals.

Realized Gross Farm Income. The distribution of cash receipts was discussed in conjunction with the derivation of the estimates of number of farms by economic class. Table 1 showing the derivation of the distribution of cash receipts summarizes the final calculation using 1964 average value of sales estimates in the first approximations for all classes except Class I. The Class I average value of sales approximator was derived by projecting the trend between 1959 and 1964 to 1966 based on changes in the U.S. average value of sales.

The 1966 distributions of Government payments, home consumption and gross rental value of farm dwellings were derived by using the same per farm averages in the first approximations as were used for 1959 and 1964.

The gross income of nonfarm landlords needed to compute operators' gross farm income was derived by computing the ratios of nonfarm landlords' gross income to the value of land and buildings operated in 1959 and then applying these ratios to the 1966 estimates of the value of land and buildings operated to obtain a first approximation.

Production Expenses and Realized Net Farm Income. Production expenses estimates by economic class in 1966 were computed as the difference between realized gross farm income and realized net farm income. Realized net farm income was estimated by computing the ratios of net income (excluding Government payments) to gross income (excluding Government payments) in 1964 and then applying these ratios to the corresponding 1966 gross income estimates. This first approximation was then adjusted to the official control total and Government payments added.

Productive Assets and Labor Used Estimates. First approximations of (1) value of real estate operated, (2) value of real estate owned by farmers, (3) operators' equity in real estate, (4) value of non-real assets operated, (5) value of non-real assets owned by farmers, operators' equity in non-real assets, (6) hours of operator labor, (7) hours of unpaid family labor, and (8) wages paid hired farm workers were derived by using the ratios of these items to gross income in 1964 and gross income estimates for 1966.

After these first approximations were adjusted to the official control totals, operators' total debt was computed as the difference between all assets owned and operators' equity assets. The value of assets owned by nonfarm landlords was computed as the difference between the total value of assets operated and the total value of assets owned by farm operators. The first approximation of the hours worked by hired farm workers was derived by dividing the 1966 estimates of wages paid by the per hour wage rates computed for 1959.

Control Totals Used in the Parity Study. Control totals of farm income and expenses are the official estimates prepared and published by the Economic Research Service.

Totals for productive assets are those published by the Economic Research Service in the Balance Sheet of Agriculture, except for value of farm real estate. The published value of real estate was adjusted by Farm Production Economics Division, ERS, to be consistent with acreage levels estimated by the Statistical Reporting Service and to include the value of farm dwellings.

The control totals for operators' equity assets are derived by subtracting from the value of total productive assets the estimated value of assets owned by nonfarm landlords and amount of borrowed capital owed by farm operators.

Real estate owned by nonfarm landlords is calculated as the product of (1) the value of all farm land and buildings, (2) the ratio of rented farm real estate to all farm real estate, and (3) the ratio of nonfarm landlords to all landlords. Nonfarm landlords are assumed to own 2 percent of the value of non-real estate assets.

The amount of debt owned by operators is calculated as total borrowed capital less the estimated debt of nonfarm landlords. Nonfarm landlord debt is calculated as the product of (1) total borrowed capital, (2) the ratio of debt owed by all landlords to total debt, and (3) the ratio of nonfarm landlords to all landlords.

The ratios mentioned in the above explanation of the derivation of equity assets were all obtained from the Farm Production Economics Division, ERS, except the ratio of landlord debt to total debt which was derived from the 1960 Sample Survey of Agriculture. Total debt is published in the Balance Sheet of Agriculture, 1965.

Man-hours of labor used for farm work is published annually by ERS in Changes in Farm Production and Efficiency. Number of man-hours of hired labor used was calculated by dividing cash wages paid hired workers as published by ERS in the Farm Income Situation by the Composite hourly wage rate published by SRS. The breakdown of the remaining man-hours of labor used for farm work between operator and unpaid family workers was according to the Census-BLS Labor Force series.

Comparability of Income and Expense Distributions With Published Estimates. The procedures described for distributing aggregates of number of farms, farm income, and expenses by economic class are the same ones used to derive the estimates by value of sales classes published in the Farm Income Situation, July 1967. They are, however, different from the estimates published in the Farm Income Situation, July 1966 and earlier years because the later estimates incorporate information recently available from the 1964 Census of Agriculture. Additional revisions will become necessary as more information becomes available from the 1964 Census and the 1965 Sample Survey of Agriculture.

PART 2: PARITY RATES OF RETURN TO FARM OPERATOR LABOR AND MANAGEMENT
AND UNPAID FAMILY LABOR

The return to labor and management included in the parity return
standard should indicate what comparable resources could earn in alter-
native employment. A person's income-earning capacity depends at least
in part on such personal characteristics as age, educational attainment,
and sex. Operators of farms in the different economic classes vary widely
with regard to these characteristics, as shown in table 3. Data are
also shown for hired farm workers who worked 25 days or more on farms,
and for unpaid family labor.

Table 3.--Median age, educational attainment, and proportion of males,
farm operators by economic class of farm, and hired farm workers

Group	Level of gross sales	Median age	Median educational attainment	Proportion of males
		Years	Years	
Farm operators by economic class of farm:				
Class I 1/	$40,000 and over	46.8	11.8	.982
Class II 1/	$20,000 to $39,999	46.4	11.6	.982
Class III 1/	$10,000 to $19,999	48.1	10.4	.982
Class I, II, III 2/	$10,000 and over	46.5	10.5	.982
Class IV 2/	$5,000 to $9,999	48.8	8.0	.984
Class V 2/	$2,500 to $4,999	52.4	7.5	.965
Class VI 2/	Under $2,500	53.8	7.0	.939
Part-time and abnormal2/:	Under $2,500	49.0	8.0	.956
Part-retirement 2/	Under $2,500	70.5	7.2	.917
All farms 2/	---	51.0	7.8	.963
Hired farm workers 3/ ....:	---	30.0	8.0	.790
Unpaid family workers 4/..:	---	40.0	7.8	.405

1/ Age and educational attainment medians derived from preliminary
data from the 1964 Census of Agriculture. Proportion of males assumed
to be equal to the 1960 ratio shown for Classes I, II, and III combined.

2/ Unpublished estimates from a cooperative study conducted by the
Economic Development Division, ERS, USDA, and Bureau of Census. In the
study, some 9,000 enumeration schedules from both the 1960 Population
Census and 1959 Agriculture Census were matched. Combined medians for
economic Classes I, II, and III are used for 1960 because of the relatively
small number of observations obtained for each of these classes in the
1960 study.

3/ Hired workers who worked more than 25 days on farms in 1959. From
ERS series on hired farm workers.

4/ Estimates developed in ERS. The median age is a rough approxima-
tion. The education and sex data are firm estimates.

To ascertain how much was earned in nonfarm employment by people in different age, education, and sex groups, five steps were followed:

(1) A multiple regression equation was calculated showing 1959 income as a function of age, education, and sex of people in central cities of urbanized areas.

(2) For each of the groups shown in table 3, the typical or median attributes (age, education, and sex) were substituted into the regression equation. The resulting income levels reflected the total income that people having these age, education, and sex attributes would have earned on the average in central cities of urbanized areas during 1959.

(3) These 1959 annual income data were adjusted downward to reflect income from wages and salaries only.

(4) The annual wage and salary incomes for 1959 were converted to hourly rates using estimates of the number of hours worked per year.

(5) Comparable hourly income estimates were calculated for 1964 and 1966 using the U.S. average manufacturing wage rates for these years as a base.

The details of these calculations and their underlying assumptions are discussed below.

(1) The multiple regression equation was calculated showing income as a quadratic function of age, education, and sex. Observations were obtained from 1960 Population Census data for central cities of urbanized areas. $\underline{1}$/ The income observations (Y) were the 1959 median incomes of persons in the various age-education-sex cells tabulated in the Census report. The age (X_1) and education (X_2) observations were taken as the mid-range of the age class or education interval, respectively. Sex (X_3) was coded as 1.0 for males and 0 for females. This allowed a literal interpretation of this variable in the equation as the proportion of males in each group, as shown in table 3. A total of 148 observations

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$\underline{1}$/ U.S. Bureau of the Census. U.S. Census of Population: 1960. Subject Reports. Educational Attainment. Final Report PC (2)-5B. U.S. Govt. Printing Office, Washington, D.C., 1963. Table 6, pp. 92-93; table 7, pp. 116-117. For the 21 to 24-year age groups, observations showing more than 12 years of educational attainment were deleted. Likewise for the 25 to 29-year age group, observations showing more than 16 years of education were deleted. These observations were deleted because they were thought to be unduly influenced by the low earnings of college students prior to graduation.

were obtained in this way from the tabulated Census data.
The resulting equation is as follows:

$$Y = -3471.3235 + 226.60418** \ X_1 - 51.64458* \ X_2$$

$$+2.094.5807** \ X_3 - 2.44571** \ X_1{}^2 + 14.94676** \ X_2{}^2$$

* The coefficient is significantly different from zero
at the 0.80 level of probability.
** The coefficient is significantly different from zero
at the 0.999 level of probability.

The multiple R^2 for this equation is 0.89. All the coeffi-
cients were statistically significant at an acceptable level
of probability. Other equations were also evaluated,
including some equations having interaction terms. These
interaction terms were not significantly different from
zero, and the R^2 was not materially increased. Consequently,
these alternative equations were rejected in favor of the
one shown above.

(2) For each group shown in table 3, the typical or median age,
education, and sex attributes were substituted into the
regression equation to determine the total money income that
persons having these attributes would have earned in 1959
in central cities of urbanized areas. Results of these calcu-
lations are shown in column 1, table 4.

(3) These 1959 annual income data were then adjusted downward
to reflect income derived from wages and salaries only. The
estimated proportion of income derived from wages and salaries
in 1959 was used in making this adjustment (column 2, table 4).
For persons over age 65 (corresponding to the part-retirement
class of farms) the proportion of total income derived
from wages and salaries was estimated as 32 percent. This
estimate was obtained by interpolating data for unrelated
individuals over age 65. 2/ In attempting to obtain a
similar ratio for the other groups, we examined Census data
indicating the wage and salary incomes of families in
urban areas, and the total income of these people. 3/ These
data suggested that in the $4,000 to $5,000 income interval,
roughly 85 percent of total income was wage or salary earnings.
The total income calculated for all the economic classes

2/ U.S. Bureau of the Census, U.S. Census of Population: 1960.
Subject Reports Sources and Structure of Family Income. Final Report
PC (2)-4C, U.S. Govt. Printing Off., Washington, D.C. 1964, table 6.
3/ Ibid., table 4.

Table 4.--Estimated "opportunity cost" hourly rates of return, farm operators by economic class of farm, hired farm workers, and unpaid family labor, 1959

Group	(1) Y = total money income for 1959 1/	(2) Proportion of: income from wages and salaries 2/	(3) (1) x (2) Wage and salary income in 1959	(4) Hours worked per year 3/	(5) (3) ÷ (4) "Opportunity cost" in 1959
	(1)	(2)	(3)	(4)	(5)
	Dollars	Ratio	Dollars	Hours	Dollars
Farm operators, by economic class of farm:					
Class I ....:	5,306	.85	4,510	1,909	4/2.31
Class II ....:	5,247	.85	4,460	1,909	4/2.29
Class III ....:	4,906	.85	4,170	1,909	4/2.14
Class I, II, III..:	4,940	.85	4,199	1,909	2.20
Class IV ....:	4,367	.85	3,712	1,910	1.94
Class V ....:	4,162	.85	3,538	1,899	1.86
Class VI ....:	3,979	.85	3,382	1,884	1.80
Part-time and abnormal ....:	4,306	.85	3,660	1,894	1.93
Part-retirement...:	2,672	.32	855	900	.95
All farms ....:	4,248	.85	3,611	1,898	1.90
Hired farm labor ...:	3,324	.80	2,659	1,729	.1.54
Unpaid family labor :	3,035	.80	2,428	1,513	1.60

1/ Estimated from regression equation as a function of age, education, and sex.
2/ Estimated from Census data, as explained in text.
3/ Estimated from 1964 data published by the Bureau of the Census, as discussed in text.
4/ Computed by dividing 97.88 percent of the annual income in column (3) by 1,909 hours as explained in the text.

other than operators of part-retirement farms fell in this income interval. Therefore, it was assumed that 85 percent of their income was derived from wages and salaries. A similar comparison was made for the other two groups--hired farm workers and unpaid family labor. Groups of people in central cities of urbanized areas having the same median age, education, and sex characteristics as these two groups received about $3,000 annual income (table 4). On the average, roughly 80 percent of this income was derived from wages and salaries. 4/

These percentages were then multiplied by the total money income estimates (Y) to estimate the annual wage and salary incomes of these groups (column 3, table 4). These estimates are interpreted as indicating the 1959 wage and salary earnings of groups of people in central cities having age, education, and sex characteristics similar to those exhibited by (a) operators of farms in the respective economic classes, (b) hired farm workers, and (c) unpaid family workers, respectively.

(4) Annual income data for 1959 were then converted to hourly rates using estimates of the number of hours worked per year (column 4, table 4). The number of hours worked per year (H) was estimated as a function of age and sex as follows. For all economic classes of farms except part-retirement, the average age of farmers lies between 45 and 54 years. The "percent participation" for this age class was estimated from 1964 data, by calculating the ratio: median income of all persons of each sex in this age class, divided by the year-round full-time median income for these persons. 5/ The "percent participation" ratios estimated in this manner were then multiplied by the number of working hours in a year (2,080) to estimate the number of hours worked per year for persons of each sex. 6/ For part-retirement farms, the same procedure was used, except that data for persons 65 and over were used. For hired farm workers, data for the 25-34 age class were used; for the unpaid family workers, data for the 35-44 age class were used. The calculations are shown in table 5.

These estimates of hours worked by men and the comparable estimates for women were combined into weighted averages for each group. The weights used were the proportions of each

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4/ Ibid.
5/ Income in 1964 of Families and Persons in the United States, Current Population Report. Series P-60, No. 47, U.S. Govt. Printing Off., Washington, D.C., 1965. Table 20, p. 38.
6/ Two thousand and eighty is the number of hours for which full-time employees were paid, including paid vacation and sick leave.

Table 5.--Median income, percent participation, and estimated hours worked

Age and sex	Actual median income in 1959 (1)	1959 Year-round full-time median income (2)	(1) ÷ (2) Estimated percent participation (3)	(3) x 2,080 Estimated hours worked per year (4)
	Dollars	Dollars	Ratio	Hours
25 to 34:				
Male .....:	5,733	6,279	.9130	1,899.0
Female ...:	2,036	3,893	.5230	1,088.0
35 to 44:				
Male .....:	6,500	6,969	.9327	1,940.0
Female ...:	2,259	3,846	.5874	1,221.8
45 to 54:				
Male .....:	6,075	6,582	.9320	1,919.8
Female ...:	2,410	3,775	.6384	1,327.9
65 years and over:				
Male .....:	2,037	4,599	.4429	921.9
Female ...:	952	2,960	.3216	668.9

sex occurring among persons in the respective groups. Thus the number of hours worked was estimated as a function of age and sex, as shown in table 6.

The estimates in table 6 were assumed to reflect the number of hours worked for wages and salaries by persons in central cities having age, education, and sex characteristics similar to those exhibited by operators of farms in the various economic classes, by hired farm workers, and by unpaid family labor. Dividing the wage and salary income by the number of hours worked, an estimated "opportunity cost" hourly earnings rate was obtained for each of the groups (column 5, table 4). The income data from which these rates were derived reflect the earnings of salaried managers as well as laborers. Therefore, these earning rates may be interpreted as the "opportunity cost" of both the labor and management of farm operators. [7] The separate annual wage and salary income

[7] It is recognized that the proportionate representation of managers in the central cities data is probably less than the proportion of the farm operator's time devoted to management-type activities. However, experience in managing a farm does not necessarily raise a person's opportunity cost by qualifying him for a managerial position in a nonfarm industry. Thus, this consideration should not detract significantly from the accuracy of the "opportunity cost" earning rates derived here.

Table 6.--Median age, proportion of males and females, and
hours worked

Group	Median age	Male proportion	Hours worked per year (male)	Female proportion	Hours worked per year (female)	(2)x(3) +(4)x(5) Average hours worked per year
	(1)	(2)	(3)	(4)	(5)	(6)
	Years	Ratio	Hours	Ratio	Hours	Hours
Farm operators, by economic class of farm:						
Class I ....:	46.8	.982	1,919.8	.018	1,327.9	1,909
Class II ....:	46.4	.982	1,919.8	.018	1,327.9	1,909
Class III ....:	48.1	.982	1,919.8	.018	1,327.9	1,909
Class I, II, III..:	46.5	.982	1,919.8	.018	1,327.9	1,909
Class IV ....:	48.8	.984	1,919.8	.016	1,327.9	1,910
Class V ....:	52.4	.965	1,919.8	.035	1,327.9	1,899
Class VI ....:	53.8	.939	1,919.8	.061	1,327.9	1,884
Part-time and abnormal ....:	49.0	.956	1,919.8	.044	1,327.9	1,894
Part-retirement ..:	70.5	.917	921.2	.083	668.9	900
All farms ......:	51.0	.963	1,919.8	.037	1,327.9	1,898
Hired farm workers..:	30.0	.790	1,899.0	.210	1,088.0	1,729
Unpaid family labor :	40.0	.405	1,940.0	.595	1,221.8	1,513

estimates for operators of Class I, II, and III farms are
based on 1964 characteristics. It was, therefore, necessary
to compute the separate per hour wage rates for these groups
by dividing only 97.88 percent of the annual wage and
salary incomes by 1,909 hours. This 2 percent adjustment
was required to make the weighted average wage and salary
income for these three groups equal to the estimate for
these groups combined based on 1960 characteristics.

(5) Finally, these 1959 "opportunity cost" rates were adjusted
to 1964 and 1966 levels as shown in table 7. This adjustment
was made on the basis of changes in the U.S. average manu-
facturing wage rate during this period. 8/ For example,
the 1959 "opportunity cost" earnings rate for operators of
farms in economic Class I is 105.5 percent of the

8/ Economic Report of the President, 1966. U.S. Govt. Printing
Off., Washington, D.C., 1966, p. 241.

Table 7.--Estimated "opportunity cost" hourly rate of return for groups in the farm working force, 1959, 1964, and 1966

Group	1959 "opportunity cost" hourly rate of earnings (1)	1959 "opportunity cost" (1) as proportion of $2.19 1/ (2)	1964 "opportunity cost" =(2) x $2.53 2/ (3)	1966 "opportunity cost" =(2) x $2.71 3/ (4)
	Dollars	Ratio	Dollars	Dollars
Farm operators, by economic class of farm:				
Class I ....:	2.31	1.055	2.67	2.86
Class II ....:	2.29	1.046	2.65	2.83
Class III ....:	2.14	.977	2.47	2.65
Class IV ....:	1.94	.886	2.24	2.40
Class V ....:	1.86	.849	2.15	2.30
Class VI ....:	1.80	.822	2.08	2.23
Part-time and abnormal ....:	1.93	.881	2.23	2.39
Part-retirement...:	.95	.434	1.10	1.18
All farms ......:	1.90	.868	2.20	2.35
Hired farm workers..:	1.54	.703	1.78	1.90
Unpaid family workers ....:	1.60	.731	1.85	1.98

1/ The wage rate for manufacturing employees in the United States in 1959 was $2.19 per hour, as shown in the 1967 Economic Report of the President.
2/ The 1964 wage rate for manufacturing employees was $2.53 (ibid).
3/ The 1966 wage rate for manufacturing employees was $2.71 (ibid).

manufacturing wage rate ($2.31 ÷ $2.19 = 1.055). The "opportunity cost" rates for 1964 and 1966 were calculated at 105.5 percent of the manufacturing wage rates in those years, as shown in table 7. Similar proportionate adjustments were made for the other economic classes of farms, for hired farm workers, and for unpaid family labor.

The key assumptions underlying this procedure are:

(a) The labor earnings of workers in central cities of urbanized areas in each age-education-sex category changed in the same proportion as the manufacturing wage rate;

(b) The age-education-sex characteristics of the different groups of farm people did not change.

Lack of complete data for the later years requires these assumptions.

In brief, this analysis has shown that the "opportunity cost" of farm operator labor and management in the various economic classes as well as the opportunity cost of labor of hired workers and of unpaid family labor can be calculated as a function of the age, education, and sex (proportion of males) of persons in these groups. For operators of farms in economic Classes I and II,--the farms with value of sales of $20,000 or more--the opportunity costs are above the U.S. average hourly earnings of manufacturing workers. "Opportunity costs" derived for operators of the other economic classes of farms, as well as for unpaid family workers, are lower than the manufacturing rate because they differ in age, education, and percentage of males.

PART 3: METHOD OF ESTIMATING NET RENTAL RETURNS TO FARMLAND

The estimates of net rental returns received by landlords are based on 112.1 million acres of rented farmland--about 10 percent of the U.S. total-- valued at $20.7 billion in 1959, and containing 55.7 million acres of cropland. Although about one-fifth of all farms were operated by tenants in 1959, the rental arrangements for some classes of tenants involved landlord contributions other than land, or family or personal considerations which would bias estimates of net rents. Another fifth of all farms were operated by part owners who rented a part of their farms, but the characteristics of the land they rented and their rental arrangements are for the most part unknown. For these reasons, and for others involving methodological considerations, the decision was made to limit rental estimates to two classes of "commercial" tenant farms. These include two subclasses of share tenant farms (crop-share and share-cash), and cash tenant farms. Livestock-share tenant farms, croppers and "other and unspecified" rental arrangements were excluded.

Estimating procedures involved essentially four main steps: (1) estimating gross rents paid by share and share-cash tenants, (2) estimating gross rents paid by cash tenants, (3) estimating expenses paid by landlords of each class of tenant, and (4) imputing the rent-to-value relationships found for share and cash-rent farms to owner-operator farms.

Data used were drawn from the 1959 Census of Agriculture, a 1956 survey of rental arrangements, and yearly estimates of the value of crop production. The 1959 census served as a benchmark for the number of acres in such farms, the number of cropland acres, the distribution of crop production by tenant classes, and the value of land and buildings. Both acres in farms and acres of cropland harvested were held constant from 1959 through 1965. The value of land and buildings was adjusted annually by the change in the State indexes of farm real estate values per acre.

Share and Share-Cash Rented Land

Gross Rents Paid by Share and
  Share-Cash Tenants

A tabulation in the 1959 Census of Agriculture showing production of various crops by tenure (State table 21) provided the basic data for estimating gross rents. The production of each specified crop on commercial share and share-cash tenant farms was first expressed as a percentage of the total pro- duction of all farms, and this percentage was then multiplied by the average rental share for each crop. The resulting factor was used as a constant and applied to the total value of production of each crop, as estimated annually by the Statistical Reporting Service. Total gross rents were the sum of the rents for the individual crops reported in the census tabulation.

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Because the acreage of specified crops reported by the census did not account for the total acreage of harvested cropland, it was necessary to expand the sum of the specified crop rentals to a total cropland basis. The ratio of specified crop acreage to total harvested cropland was used to make this adjustment. The basic assumption was that the average gross rental returns from the crops not listed was the same as from the specified crops.

The cash rent paid by share-cash tenants is chiefly for hay and pastureland, and the per farm figures as reported in the 1959 Census of Agriculture was taken as a benchmark. The per farm figures were multiplied by the number of share-cash tenant farms in 1959, and this total cash rent figure was adjusted upward by the increase in cash rent paid for pastureland in each subsequent year.

Government Payments Received
by Landlords

Separate estimating procedures were used to determine the probable income landlords received from each of the various types of farm programs. None of the Soil Bank payments were allocated to landlords, however, because it seemed unlikely that landlords and tenants of commercial farms would have participated in this particular program. A substantial proportion of all Soil Bank contracts involved whole farms which were not included in the 1959 census enumeration. Field studies also have shown that participation was quite low in commercial farming areas where the majority of the tenant farms are located.

Total conservation (ACP) payments were first adjusted to exclude payments made for water and wildlife conservation. These adjusted payments for establishment or improvement of cover crops were then allocated to tenant farms proportional to the acreage of soil-conserving crops on such farms. The portion of such payments received by landlords was assumed to be proportional to the rental share for hay crops times the percentage of landlords sharing in seed and fertilizer expenses.

Payments made under the sugar and cotton programs were assumed to have been proportional to the production of these crops on share tenant farms. The landlords' share was assumed to be the same as the share of these crops they received as rent.

Wheat and feed grain payments were allocated to landlords on the following basis. First, the acreage of feed grains reported in 1959 was assumed to represent the base acreage of feed grains for both tenant and owner-operated farms. Second, the proportion of total feed grains produced on share tenant farms was calculated, and adjusted for a somewhat lower rate of participation as shown by a North Central Region study. The final step was to assume that the diversion payments were shared by landlords in the same proportion as their share of feed grain crops.

Price support payments for wheat and feed grains were allocated to landlords in proportion to the value of production of these crops on share-rented farms, assuming sharing of payments to be the same as the sharing of crops.

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No Government payments were allocated to landlords of cash rent farms. Any indirect benefits of farm programs were assumed to be reflected in the cash rental rates charged.

Gross rents on share tenant farms for each State were estimated as comprising Government payments allocated to landlords, plus crop share rents, plus cash rents for hay and pasture.

Landlords' Expenses

Two general categories of landlords' expenses were estimated (1) fixed, or overhead costs, paid entirely by landlords, and (2) variable crop expenses which are typically shared by landlords and tenants. Fixed expenses included (1) taxes on farm real estate, (2) fire and wind insurance on buildings, (3) accidental damage to buildings, and (4) building improvements, maintenance, and depreciation.

Taxes were estimated by applying the tax per $100 of value to the market value of share and cash-rented farms. Fire and wind insurance, as well as building maintenance, depreciation, and accidental damage were allocated to rented buildings in proportion to their market value. The market value of rented buildings was derived from the relationship between per farm values for tenant farms and all farms reported in the 1940 census. This relationship was applied to estimates of building values per farm for all farms in 1959 to obtain estimates of the value of buildings on share and cash tenant farms in 1959. Expressing such building values as a percentage of value of all buildings provided the allocative factor to be applied to the total expenditure for these items. The estimates were moved forward for succeeding years by the changes in the total expenditures for all farms.

Variable expenses typically shared by landlords include cost of fertilizer and lime, seed, spraying, cotton ginning, harvesting, crop insurance, and irrigation water. In most cases, the total expenditure for each item for all farms was used as the initial starting point in deriving the probable expenditure by landlords. The proportion of each expenditure associated with the production on share rent farms was estimated, and then adjusted to reflect the proportion of landlords who shared in each expenditure, and the average share they paid. In the case of seed and fertilizer, the expenditures reported for share tenant farms in the 1959 Census of Agriculture was used directly, adjusted for the proportion of landlords sharing these expenses and the average share they paid.

Harvesting costs paid by landlords were assumed to be proportional to the value of production of certain crops where harvesting costs are shared. Ginning costs for cotton were assumed to be proportional to the bales of cotton received by landlords as rent. Spraying costs and crop insurance premiums were assumed to be proportional to the acreage of cropland harvested.

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The sum of the various expense items was deducted from the gross rental income to obtain net rents. These were then expressed as a percentage return on the annual market values of rented land and buildings.

Cash-Rented Land

Rents Paid by
Cash Tenants

Cash rents paid by cash tenants were reported in the 1959 Census of Agriculture, but were found to be substantially lower than the estimates obtained annually by the Statistical Reporting Service from crop reporters. Reasons for the apparent downward bias in census data are not clear, but are believed to result from definitional and tabulation problems. In any event, the decision was made to utilize the ratios of gross cash rent to market value of cash-rented farms derived from crop reporter data.

A benchmark value for commercial cash rent farms was derived from 1959 census data and adjusted forward by the change in the State indexes of average value per acre. Ratios of rent to value based on 3-year moving averages were then applied to these estimates of total value to obtain gross cash rents. In the 11 Western States, separate rent-to-value ratios were developed for irrigated, dry-farming, and grazing lands, and weighted by the estimated market value of each class of land in cash tenant farms to obtain a composite ratio. This allowed for possible differences in land use on cash tenant farms in comparison with all farms.

Landlords' Expenses on
Cash-Rent Farms

Because such landlords of cash rent farms typically pay only fixed or overhead expenses, essentially the same estimating procedures were used as for share-rent farms. No allocation of variable crop expenses was made to landlords of cash-rent farms.

Net rents for cash tenant farms for each State were added to the net returns for share rent farms, and the sum was divided by the total market value of each class of farm to obtain a weighted net rate of return for both methods of renting. State weighting was necessary to recognize the relative frequency of each method of renting, as well as somewhat different rates of return.

The final step in deriving the imputed net rental return for owner-operated land was to apply the composite rates for each State to the estimated market value of owner-operated farms. The value of full-owner farms was derived from the 1959 census and projected by the annual change in per acre value. The value of land owned by part owners was derived from the special census of farm debt in 1961, and combined with the value of full-owner farms, with similar annual adjustments in value per acre.

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(1) U.S. Bureau of the Census:

U.S. Census of Agriculture: 1940. Data on value of buildings by tenure.
U.S. Census of Agriculture: 1959. State tables 21 and 22.
U.S. Census of Agriculture: 1959. 1960 Sample Survey of Agriculture.
U.S. Census of Agriculture: 1959. Farm Taxes and Farm Mortgage.

(2) U.S. Department of Agriculture:

Unpublished data from ERS farm rental survey, 1956.
Farm Real Estate Taxes.
Farm Income Situations, 1960-66. Also unpublished estimates of certain
  expenditures.
Value of Crop Production, December 1959-65.
Statistical Fiscal Summary, ACP Programs, 1959-64.
Unpublished data on cash rents for farms and for pasture, and values
  of such lands, SRS crop reporters.

Table 8.—Gross and net rents on commercial share cash, crop share, and cash tenant farms, 1959-65

Year	Share tenant farms					Landlord expenses			Net rent	
	Crop share	Cash	Government payments	Cash tenant farms	Total	Share	Cash	Total	Total	Government payments as percentage of total net rent
	Thou. dol.	Thou. dol.	Thou. dol.	Thou. dol.	Thou. dol.	Thou. dol.	Thou. dol.	Thou. dol.	Thou. dol.	Percent
1959	1,016,330	64,640	17,314	209,729	1,308,004	322,949	59,325	382,274	925,481	1.9
1960	1,059,682	66,626	17,650	221,523	1,365,481	336,187	61,720	397,907	967,574	1.8
1961	1,116,882	67,564	76,903	220,706	1,482,055	344,161	63,934	408,095	1,073,960	7.2
1962	1,148,383	68,989	92,913	229,091	1,539,376	338,135	63,588	401,723	1,137,653	8.2
1963	1,210,482	71,490	96,590	231,027	1,609,589	367,060	69,514	436,574	1,172,915	8.2
1964	1,140,344	74,006	140,191	242,582	1,591,123	380,229	72,498	452,727	1,144,396	12.3
1965 1/	1,198,309	75,794	159,799	254,177	1,689,079	395,735	75,753	471,488	1,217,591	13.1
					Index (1959 = 100)					
1960	104.3	103.1	101.9	105.6	104.4	104.1	104.0	104.1	104.5	---
1961	109.9	104.5	444.2	105.2	113.3	106.6	107.8	106.8	116.0	---
1962	113.0	106.7	536.6	109.2	117.7	104.7	107.2	105.1	122.9	---
1963	119.1	110.6	557.9	110.2	123.1	113.7	117.2	114.2	126.7	---
1964	112.2	114.5	809.7	115.7	121.6	117.7	122.2	118.4	123.7	---
1965 1/	117.9	118.8	922.9	121.2	129.1	122.5	127.7	123.3	131.6	---

1/ Preliminary.

Table 9.--Selected data on rent, 1959-65

Year	Value of land and buildings on tenant farms				Net rent		Ratio of rent to value				Net rent excluding Government payments	Ratio excluding Government payments
	Share tenant farms	Cash tenant farms	Total	As percentage of all land and buildings	Share	Cash	Share	Cash	Combined	Weighted by owned and operated		
	Mil. dol.	Mil. dol.	Mil. dol.	Pct.	Thou. dol.	Thou. dol.	Pct.	Pct.	Pct.	Pct.	Thou. dol.	Pct.
1959	13,990.1	3,232.2	17,222.3	13.8	775,286	150,195	5.5	4.6	5.4	5.9	908,167	5.3
1960	14,460.2	3,388.2	17,848.4	13.7	807,797	159,803	5.6	4.7	5.4	5.9	949,924	5.3
1961	14,409.1	3,564.9	17,974.0	13.7	917,135	156,772	6.4	4.4	6.0	6.2	997,057	5.5
1962	15,080.2	3,639.4	18,719.6	13.7	972,150	162,503	6.4	4.5	6.1	6.2	1,044,740	5.6
1963	15,757.6	3,800.6	19,558.2	13.7	1,011,450	161,513	6.4	4.2	6.0	6.2	1,076,325	5.5
1964	16,622.8	4,037.6	20,660.4	13.7	974,257	170,084	5.9	4.2	5.5	5.8	1,004,205	4.9
1965 1/	17,647.8	4,308.6	21,956.4	13.8	1,039,106	178,424	5.9	4.1	5.5	5.7	1,057,792	4.8
					Index (1959 = 100)							
1960	103.4	104.8	103.6	---	104.2	106.4	---	---	---	---	104.6	---
1961	103.0	110.3	104.4	---	118.3	104.3	---	---	---	---	109.8	---
1962	107.8	112.6	108.7	---	125.4	108.2	---	---	---	---	115.0	---
1963	112.6	117.6	113.6	---	130.5	107.5	---	---	---	---	118.5	---
1964	118.8	124.9	120.0	---	125.7	113.2	---	---	---	---	110.6	---
1965 1/	126.1	133.3	127.5	---	134.0	118.8	---	---	---	---	116.5	---

1/ Preliminary.

Table 10.--Value of owner-operated land and buildings on commercial
farms, and imputed net rent, 1959-65

Year	Value of owner-operated land and buildings	Ratio of rent to value	Imputed rent
	1,000 dollars	Percent	1,000 dollars
1959	58,218,110	5.9	3,457,040
1960	60,662,548	5.9	3,554,407
1961	61,722,075	6.2	3,837,467
1962	64,886,188	6.2	4,045,615
1963	67,742,742	6.2	4,204,899
1964	71,816,525	5.8	4,130,632
1965	76,286,'91	5.7	4,322,249

UNITED STATES DEPARTMENT OF AGRICULTURE
ECONOMIC RESEARCH SERVICE
WASHINGTON, D.C. 20250

OFFICE OF THE ADMINISTRATOR

July 7, 1967

Dr. Walter W. Wilcox
Director, Agricultural Economics
U.S. Department of Agriculture
Washington, D. C. 20250

Dear Dr. Wilcox:

I transmit herewith our report of a study of the parity income of
farmers. This study was required by Section 705 of the Food and Agri-
culture Act of 1965.

Section 705 directed that the study be completed and a report submitted
to the Congress not later than June 30, 1966. However, at the request
of the Chairmen of the Committee on Agriculture of the House and of
the Committee on Agriculture and Forestry of the Senate, completion of
the study was delayed pending availability of data from the most recent
Census of Agriculture. The study has now been completed and this report
is submitted for your approval and transmission to the Congress.

Section 705 requested the development of criteria for measuring parity
income of commercial family farms. Despite our best efforts, and with
the help of leading agricultural economists, we were unable to develop
a parity income index from available data that was fully satisfactory.
In this study we have developed a concept of "parity returns," which
may be a useful supplement to other measures of the economic health
of American farmers. The concept, the methods used, and the results
are explained in the report. Realized net income, however, remains the
single most reliable measure of the economic well-being of farm families.

In preparation of this report we had the advice of: Willard W. Cochrane,
Dean, Office of International Programs, University of Minnesota; D. Gale
Johnson, Dean, Division of Social Science, University of Chicago;
Charles E. Bishop, Vice President, University of North Carolina; Dale E.
Hathaway, Professor, Department of Agricultural Economics, Michigan State
University; and Luther G. Tweeten, Professor, Department of Agricultural
Economics, Oklahoma State University.

The advice of these men was confined to issues of validity and reason-
ableness of the various assumptions required to make comparisons of
the income of farmers with the income of farm labor and resources if
they were used elsewhere in the economy. The advisers agree that the

comparisons used are valid and that a thorough analysis of the data was made. They conclude that this study (1) makes a significant step toward a measurement of the economic situation of farmers, and (2) points out where further refinements can be made only with improved sources of data.

The parity returns measures developed in this study show that:

(1) Farmers on the average earned, in 1966, 81 percent as much as they might have earned by renting out their land and accepting nonfarm employment. They earned 96 percent as much as they might expect by selling their land, investing in common stocks, and working elsewhere. In 1959 and 1964 the ratio of farm earnings to "parity returns" was lower than in 1966.

(2) Farmers with over $20,000 gross income from farming averaged parity or more than parity returns in 1966 under each of the methods used for comparison.

(3) The smaller farmers (those with less than $20,000 gross income from farming) earned less than parity returns under all methods of comparison and in all years tested.

(4) Farmers in the lowest income group (under $5,000 gross sales) earned only one-third to two-fifths of parity returns even in 1966.

"Parity returns," as developed in this study, are the equivalent returns that labor and capital employed in farming might get if they were employed elsewhere in the economy. Statistical measurements of parity returns were developed for all farms combined, for several types of farms, and for size classes of farms as indicated by value of sales. Computation by size classes is important because income of a farm generally varies in relation to the amount of capital and labor used in production.

Parity returns for a farmer's equity capital involves: (1) The value of capital including real estate, (2) the rate of return, and (3) capital gains. Two of many possible ways to calculate parity returns on capital were judged to be superior to the others. These are termed the "land-lord standard" and the "stockholder standard."

The annual rate of return under the landlord standard is that obtained on rented farmland. In recent years this rate has averaged around 5.7 percent of the current value of farm capital. Capital gains are measured in terms of an average rate of change in the value of farm real estate, around 4 3/4 percent per year for recent years. In terms of net return on farmer's equity the sum of these has been slightly less than 12 percent a year since 1964.

The return under the stockholder standard is measured by the yields of dividends on common stocks plus capital gains as measured by the changes in the prices of these stocks. Dividend yields have been around 3 percent a year. Capital gains in stocks have been around 8 percent a year. The sum of these is about 11 percent, slightly lower than the landlord standard.
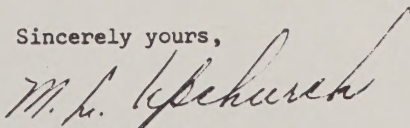
Parity returns for the labor of farm operators and unpaid members of their families require a measure of the quantity of such labor and an appropriate wage rate. In general, a person's labor earnings are related to age, education, and sex. The relation of income to these character-istics for people in central cities was developed. This relationship was used to estimate parity labor returns for operators of farms of different size classes and for unpaid family workers. For operators of farms with value of sales of $20,000 or more the resulting "parity wage" rate is about 105 percent of the average wage of manufacturing workers.

The application of the parity returns concept to different types of farms in different areas of the country is examined in Section IV. For a number of reasons, incomes in relation to parity returns vary widely among different types of farms. To estimate parity returns ratios by type of farm on a periodic basis would require enormous, detailed statistics. Thus, we do not recommend attempting to apply parity returns by type of farm.

In Section V we discuss the use of and evaluate the parity returns concept. Parity returns conceivably could be used as one measure of the economic situation of farmers. It could be an improvement over earlier definitions of parity income. If a parity returns concept were to be used in measuring farmers' overall financial condition over a period of years, capital gains or losses should be included. However, for some purposes, parity returns excluding capital gains may be more useful. If parity returns were to be used as a periodic measure of the economic situation of farmers, the landlord standard would be the preferred measure.

If parity returns were to be adopted, provision must be made for regular collection of data adequate to make current estimates with an acceptable degree of accuracy. Present data are not adequate. Numerous assump-tions and considered judgment were required in developing the measures of parity returns in this report.

Sincerely yours,

M. L. Upchurch
Administrator

Enclosure